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ISAAC HAYS, M.D.,

FELLOW OF THE PHILADELPHIA COLLEGE OF PHYSICIANS; MEMBER OF THE
AMERICAN MEDICAL ASSOCIATION; OF THE AMERICAN PHILOSOPHICAL SOCIETY; OF THE
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TO READERS AND CORRESPONDENTS.

All articles intended for the Original Department of this Journal must be communicated to it *exclusively.*

Contributors who design to favour us with original papers for the next No. should forward them before the 1st of February next.

The pressure of original articles has compelled us to omit several book notices intended for this No.

Communications have been received from Drs. Hildreth, Black, Salisbury, Moorman, Haughton, Leavitt, Kempf, Prettyman, Elsberg, Woodbury, Wetherbee, Manly, and Wells.

The following works have been received:—

Report on the Physiological Action of Nitrate of Amyl made to British Assoc. for Advancement of Science, 1864. By B. W. Richardson, M. A., M. D. (From the Author.)

An Inquiry into the Possibility of Restoring the Life of Warm-blooded Animals in certain cases where the Respiration, the Circulation, and the Ordinary Manifestations of Organic Motion are exhausted or have ceased. By Benj. Ward Richardson, M. A., M. D. From the Proceedings of the Royal Society, June 15, 1865. (From the Author.)

Ligature of the Left Common Iliac Artery, being the second operation in Ireland, and the first successful case of it. By Wm. Hargrave, A. M., M. D., Univ. Dublin, Prof. of Surgery in Royal Coll. Surg. Ireland, &c. &c. &c. Dublin, 1865. (From the Author.)

Contributions to Dermatology. No. III. Psoriasis and Lepra. By T. M'Call Anderson, M. D., F. F. P. and S., Physician to the Dispensary for Skin Diseases, &c. &c. London: John Churchill & Sons, 1865. (From the Author.)

Orthopraxy: the Mechanical Treatment of Deformities, Debilities, and Deficiencies of the Human Frame. A Manual. By Henry Heather Bigg, Assoc. Inst. C. E. Anatomical Mechanist to the Queen and Prince of Wales; and various Hospitals, &c. London: John Churchill & Sons, 1865. (From the Publishers.)

Practical Essay on the Use of the Nitrate of Silver in the Treatment of Inflammation, Wounds, and Ulcers. By John Higginbottom, F. R. S., Hon. F. R. C. S. of England. Third Edition, much improved. London: John Churchill & Sons, 1865. (From the Publishers.)

Obscure Diseases of the Brain and Mind. By Forbes Winslow, M. D., D. C. L. Oxon., &c. &c. &c. Second American of the Third and Revised English Edition. Philadelphia: Henry C. Lea, 1866. (From the Publisher.)

Lectures on the Diseases of Infancy and Childhood. By Charles West, M.D., F.R.C.P. Fourth American, from the Fifth Revised and Enlarged English Edition. Philadelphia: Henry C. Lea, 1866. (From the Publisher.)

On the Diseases, Injuries, and Malformations of the Rectum and Anus, with Remarks on Habitual Constipation. By T. J. Ashton, formerly Surgeon to the Blenheim Dispensary &c., &c., &c. With Illustrations. Second American, from the Fourth Revised English Edition. Philadelphia: Henry C. Lea, 1865. (From the Publisher.)

The Practice of Medicine and Surgery applied to the Diseases and Accidents incident to Women. By William H. Byford, A. M., M. D., Author of "A Treatise on the Chronic Inflammation and Displacements of the Unimpregnated Uterus," and Prof. of Obstetrics and Diseases of Women and Children in the Chicago Medical College. Philadelphia: Lindsay & Blakiston, 1865. (From the Publishers.)

Materia Medica, for the use of Students. By John B. Biddle, M. D., Prof. Mat. Med. and Gen. Therap. in Jefferson Medical College, &c. &c. With Illustrations. Philadelphia: Lindsay & Blakiston, 1865. (From the Publishers.)

Stimulants and Narcotics, their Mutual Relations: with Special Researches on the Action of Alcohol, Æther, and Chloroform on the Vital Organism. By Francis E. Anstie, M. D., M. R. C. P., Ass. Phys. Westminster Hospital, &c. &c. Philadelphia: Lindsay & Blakiston, 1865. (From the Author.)

The Principles of Surgery. By James Syme, F. R. S. E., Prof. Clin. Surg. in Univ. Edinburgh, &c. &c. &c. To which are appended his treatises on "The Diseases of the Rectum," "Stricture of the Urethra and Fistula in Perineo," "The Excision of Diseased Joints," and numerous additional contributions to the pathology and practice of surgery. Edited by his former Pupil, Donald Maclean, M. D., &c. &c. Philadelphia: J. B. Lippincott & Co., 1866. (From the Publishers.)

The Student's Book of Cutaneous Medicine and Diseases of the Skin. By Erasmus Wilson, F. R. S. New York, 1865. (From the Publishers.)

Rules and Special Orders of the Mower United States Army General Hospital at Chestnut Hill, Philadelphia. Philadelphia: J. B. Lippincott & Co., 1865. (From Dr. W. P. Moon.)

A Report upon Sundry Documents relating to Asiatic Cholera, transmitted by the Governor of Rhode Island, to the Board of Health of the City of Providence. By Edwin M. Snow, M. D., Superintendent of Health. Providence, 1865. (From the Author.)

A Report upon the Epidemic occurring at Maplewood Young Ladies' Institute, Pittsfield, Mass., in July and August, 1864: including a Discussion of the Causes of Typhoid Fever. By A. B. Palmer, M. D., C. L. Ford, M. D., and Pliny Earle, M. D. Boston, 1865. (From Dr. P. Earle.)

On Wakefulness, with an Introductory Chapter on the Physiology of Sleep. By William A. Hammond, M. D., F. C. P. P., &c. &c. &c. Philadelphia: J. B. Lippincott & Co., 1866. (From the Publishers.)

Contributions to Bone and Nerve Surgery. By J. C. Nott, M. D., Prof. Surg. in Mobile Medical College. Philadelphia: J. B. Lippincott & Co., 1866. (From the Author.)

The Practice of Medicine. By Thomas Hawkes Tanner, M. D., F. L. S., &c. From the Fifth London Edition: enlarged and improved. Philadelphia: Lindsay & Blakiston, 1866. (From the Publishers.)

Lectures on Epilepsy, Pain, Paralysis, and certain Disorders of the Nervous System. By Charles Bland Radcliffe, M. D., F. R. C. P. L., Physician to the National Hospital for the Paralyzed and Epileptic, &c. Philadelphia: Lindsay & Blakiston, 1866. (From the Publishers.)

Chloroform: its Action and Administration. By Arthur Ernest Sansom, M. B., Lond., &c. &c. Philadelphia: Lindsay & Blakiston, 1866. (From the Publishers.)

Rhinoscopy and Laryngoscopy; their value in Practical Medicine. By Dr. FRIEDRICH SEMELEDER, Physician in Ordinary to his Majesty the Emperor of Mexico, etc. Translated from the German, by EDWARD T. CASWELL, M. D. With Woodcuts and two Chromo-Lithographic Plates. New York: William Wood & Co., 1866.

Experimental Investigations into the Action and Uses of the Bromide of Potassium. By ROBERTS BARTHOLOW, A. M., M. D., Prof. of Physics and Medical Chemistry in Med. Coll. of Ohio, &c. &c. Cincinnati, 1865. (From the Author.)

Measures Proposed for the Prevention of Asiatic Cholera in the City of Providence: A Report to the Board of Aldermen. By EDWIN SNOW, M. D., Superintendent of Health. Providence, 1865. (From the Author.)

Proceedings of the Academy of Natural Sciences of Philadelphia. July, August, September, October, 1865.

Transactions of the American Ophthalmological Society. Second Annual Meeting, New York, June, 1865. New York, 1865.

Transactions of the Twentieth Annual Meeting of the Ohio State Medical Society, held at Ohio White Sulphur Springs, June 20, 21, and 22, 1865. Cincinnati, 1865.

Tenth Annual Report of the Trustees of the State Lunatic Asylum at Northampton, October, 1865. Boston, 1865. (From Dr. Pliny Earle.)

Reports of the Trustees and Superintendent of the Tennessee Hospital for the Insane, presented to the General Assembly, April 3, 1865. Nashville, 1865.

Sixth and Seventh Annual Reports of the Chicago Charitable Eye and Ear Infirmary, presented by the Board of Surgeons for the year ending May 1, 1864 and 1865. Chicago, 1865.

Annual Address before the Medical Society of the County of Oneida, delivered July 11, 1865. By C. B. COVENTRY, M. D., President of the Society. Published by the Society. Utica, 1865.

Observations on the Skeleton of a Hottentot. By JEFFRIES WYMAN, M. D. (From the Author.)

The following Journals have been received in exchange:—

Revue de Thérapeutique Médico-Chirurgicale. Par A. MARTIN-LAUZER, M. D., &c. Nos. 19, 20, 21, 22, 23. 1865.

Guy's Hospital Reports. Edited by SAMUEL WILKS, M. D. October, 1865.

The British and Foreign Medico-Chirurgical Review. October, 1865.

The Ophthalmic Review. Edited by J. ZACHARIAH LAURENCE and THOMAS WINDSOR. October, 1865.

Medical Times and Gazette. October, November, December, 1865.

British Medical Journal. Nos. 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254. 1865.

Edinburgh Medical Journal. August, September, October, 1865.

The Dublin Quarterly Journal of Medical Science. August, November, 1865.

The Medical Press. October, November, 1865.

The Glasgow Medical Journal. October, 1865.

The Canada Medical Journal. Edited by G. E. FENWICK, M. D., and F. W. CAMPBELL, M. D. September, October, 1865.

The Medical and Surgical Review. [Australian.] April, May, June, 1865.

The Boston Medical and Surgical Journal. Edited by SAMUEL L. ABBOT, M. D., and JAS. C. WHITE, M. D. October, November, December, 1865.

The New York Journal of Medicine. October, December, 1865.

The Cincinnati Lancet and Observer. Edited by E. B. STEVENS, M. D., and J. A. MURPHY, M. D. October, November, December, 1865.

The St. Louis Medical and Surgical Journal. Edited by M. L. LINTON, M. D., and F. W. WHITE, M. D. September, October, November, and December, 1865.

The American Journal of Insanity. Edited by the Medical Officers of the New York State Lunatic Asylum. October, 1865.

Buffalo Medical and Surgical Journal. Edited by JULIUS F. MINER, M. D. October, November, 1865.

The Chicago Medical Journal. Edited by DE LASKIE MILLER, M. D., and E. INGALS, M. D. August, September, 1865.

The Pacific Medical and Surgical Journal and Press. Edited by HENRY GIBBONS, M. D. October, 1865.

The Medical and Surgical Reporter. Edited and Published by S. W. BUTLER, M. D. October, November, December, 1865.

The American Journal of Pharmacy. Published by Authority of the Philadelphia College of Pharmacy. Edited by WILLIAM PROCTER, Jr., Professor of Pharmacy in the Philadelphia College of Pharmacy. November, 1865.

American Druggists' Circular and Chemical Gazette. October, November, December, 1865.

The Dental Cosmos: a Monthly Record of Dental Science. Edited by J. H. MCQUILLEN, D. D. S., and GEORGE J. ZIEGLER, M. D. October, November, December, 1865.

Communications intended for publication, and Books for Review, should be sent *free of expense*, directed to ISAAC HAYS, M. D., Editor of the American Journal of the Medical Sciences, care of Mr. Henry C. Lea, Philadelphia. Parcels directed as above, and (carriage paid) under cover, to Messrs. Trübner & Co., Booksellers, No. 60 Paternoster Row, *London, E. C.;* or M. Hector Bossange, Lib. quai Voltaire, No. 11, *Paris*, will reach us safely and without delay. We particularly request the attention of our foreign correspondents to the above, as we are often subjected to unnecessary expense for postage and carriage.

Private communications to the Editor may be addressed to his residence, 1525 Locust Street.

ALL REMITTANCES OF MONEY, and letters on the *business* of the Journal, should be addressed *exclusively* to the publisher, Mr. Henry C. Lea.

☞ The advertisement-sheet belongs to the business department of the Journal, and all communications for it should be made to the publishers.

To secure insertion, all advertisements should be received by the 20th of the previous month.

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  Medical Clinic of the Hôtel-Dieu. By A. Trousseau, Professor of Clinical Medicine, etc. etc. Second edition. Paris: 1865. . . . 169

XVI. Lectures on the Pathology and Treatment of Lateral and other Forms of Curvature of the Spine. By William Adams, F. R. C. S., Surgeon to the Royal Orthopædic and great Northern Hospitals, &c. &c. Delivered at the Grosvenor Place School of Medicine in the Session 1860–61. Illustrated by Five Lithograph Plates and Sixty-One Wood Engravings. 8vo. pp. 334. London: John Churchill & Sons, 1865. . 197

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XVII. Transactions of the Medical Society of the State of Pennsylvania, at its Sixteenth Annual Session, held at Altoona, June, 1865. 8vo. pp. 296. Philadelphia, 1865. 207

XVIII. Reports of American Hospitals for the Insane.
  1. Of the Indiana State Hospital, for the fiscal year 1863–64.
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XX. Materia Medica for the Use of Students. By John B. Biddle, M. D., Professor of Materia Medica and General Therapeutics in the Jefferson Medical College, Member of the American Philosophical Society, Fellow of the College of Physicians, etc. etc. With Illustrations. 8vo. pp. 359. Philadelphia: Lindsay & Blakiston, 1865. 221

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XXII. Obscure Diseases of the Brain and Mind. By Forbes Winslow, M. D., D. C. L., Oxon, etc. etc. etc. Second American, from the Third and Revised English Edition. 8vo. pp. 348. Philadelphia: Henry C. Lea. 1866. 224

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XXVI. The Essentials of Materia Medica and Therapeutics. By Alfred Baring Garrod, M. D., F. R. S. Fellow of the Royal College of Physicians; Professor of Materia Medica and Therapeutics at King's College, London; Physician to the King's College Hospital; and Examiner in Materia Medica in the University of London. 8vo. pp. 439. New York: William Wood & Co., 1865. 232

XXVII. Lectures on the Diseases of the Stomach, with an Introduction on its Anatomy and Physiology. By William Brinton, M. D., F. R. S., Physician to St. Thomas' Hospital. From the Second London Edition. 8vo. pp. 302. Philadelphia: Lea & Blanchard, 1865. 234

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XXIX. Lectures on Epilepsy, Pain, Paralysis, and certain other Disorders of the Nervous System. By Charles Bland Radcliffe, M. D., F. R. C. P., Physician to the National Hospital for the Paralytic and Epileptic, etc. etc. 12mo. pp. 280. Philadelphia: Lindsay & Blakiston, 1866. . . 236

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Bumstead's Pathology and Treatment of Venereal Diseases. Translated into the Italian by Dr. Cirillo Tamburini, Assistant Physician to the Maggiore Hospital of Milan, with notes and additions by Dr. Amilcare Ricordo, Surgeon attached to the venereal wards in the same Hospital, Milan, 1865. 236

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Art. I.—*Researches on Typhus Fever, based on Observations made during the Winter and Spring Months of* 1864. By J. M. Da Costa, M. D., one of the Physicians to the Pennsylvania Hospital.

The occurrence in several of our cities, during the last year, of a fever of a low type, dissimilar to the enteric fever which we are mainly accustomed to meet with—in other words, the existence in our midst of a fever with the characters of true typhus—is a matter which has not escaped the attention of the profession. Indeed, there are many indications that the same typhus wave which has swept so ruthlessly over several of the countries of Europe has reached our shores, and has left on them its distinct impress. Typhus fever, as is well known, is not a disease that can be said to be indigenous to the United States; and though at different times it has prevailed extensively, and though at all times cases of it are likely to be found in our seaboard towns, yet its presence in an epidemic form is not so frequent as to preclude the necessity of studying and portraying the traits it may display. In this paper, based on the examination of many cases of the disorder that have passed under my observation, I shall endeavour to give a sketch of the fever which has prevailed in Philadelphia for at least one year, and which, I think, exhibited some peculiarities which it may prove useful to record. Indeed, in the following remarks, I shall dwell on these peculiarities rather than attempt a general description of typhus fever, contrasting, as I proceed, the phenomena observed with those which the history of many epidemics has made us regard as the standard expression and history of the disease. To avoid reiteration, I may here state that the materials from which my description is drawn were collected partly in private practice, partly at the Philadelphia Hospital, but chiefly in the wards of the Pennsylvania Hospital, and that I have been much aided in gathering them together by the intelligent zeal of the Resident Physicians, Drs. Andrews and William Pepper.

The affection may begin with a chill, followed by fever which continues without remission. But in many cases pain in the back and limbs, loss of appetite, and looseness of bowels precede the febrile phenomena; symptoms which last, indeed, after the fever has fairly set in, and are in some instances associated with epistaxis. The fever is attended with a dry tongue, a flushed face, a watery eye, prostration, some dulness of hearing, and mental hebetude, but, in its earlier stages at least, very rarely with delirium. Between the fourth and seventh days an eruption appears on the skin, scattered over the abdomen, chest, and thighs, more rarely over the arms; at first much modified by pressure, but soon little influenced by it, and remaining until the decline of the malady. As the disease reaches the second week, all the symptoms of low fever become strongly marked; the teeth and lips are covered with sordes; the tongue is tremulous; the prostration and delirium or other signs of nervous derangement are more evident. The patient is often deaf; his skin cooler than during the first manifestation of the affection; the pulse ranges from about 100 to 130; the bowels in many instances retain their irritability. The subsequent progress of the case, from the end of the second week, depends greatly upon the violence of the disorder, and the termination to which it inclines: if unfavourable, depression and stupor increase, involuntary passages happen, and the patient dies exhausted; if favourable, a gradual brightening of the face, a moist tongue, and a slower pulse foretell the fortunate issue.

Such is an outline of the symptoms of the complaint as commonly seen. From even this brief description the reader will be struck with the fact of the occurrence of symptoms, such as epistaxis and diarrhœa, which are more usual in the enteric form of continued fever. But we shall best be able to appreciate in how far they belong to the disease by subjecting its principal features to a more detailed analysis, and, at the same time, its complications, of which as yet no cognizance has been taken, may be noticed.

Mode of Invasion.—In some instances the access of the disorder is sudden, even violent. This happened in two cases. In one there was severe chill, soon succeeded by wild delirium and coma; in another, a nurse, while bending over the fever patient, was seized with faintness and nausea, which were followed by a very grave attack of the malady. But these are exceptional cases. In by far the largest number the disease does not begin suddenly, nor is it ushered in by a chill. Thus of 23 cases besides those referred to, in which particulars of the onset of the affection could be obtained, a chill is only noted to have occurred in 6; in two of which it is described as a chilly sensation rather than a marked rigor, and one of which was a fatal, another a protracted case. The other early symptoms were headache, giddiness, pain in the back and limbs, loss of appetite, nausea, vomiting, sleeplessness, diarrhœa, epistaxis, cough, and palpitation. Of these, the pain in the back and lower extremities was the most constant; indeed, there was scarcely an instance in which it was found to be absent. Next in order was headache, sometimes frontal, but sometimes in the back of the head. Nausea and vomiting are mentioned in 8; nausea without vomiting in 1; a catarrhal cough with mucous expectoration in 4; severe palpitation, associated with epigastric pain, in 1 of the 23 cases. The symptoms referred to mark the commencement of the disease, and are soon combined with fever and quickened pulse; but, associated with lassitude and dejection of spirits, one or several of them may happen as premonitory signs. In several of the cases the prodromes were of a week's duration; but, as a rule, they did not precede the febrile attack for more than three or four days.

Symptoms.—In analyzing these, we shall begin with the *physiognomy.* The face of the patient is characteristic. The expression is dull, and shows no signs of suffering. Very generally the face is flushed—not deeply, but uniformly. In no instance was it of livid hue, and, as a rule, its colour was not so deep as it usually is in marked cases of typhus fever. The eye is always suffused, the conjunctiva commonly more or less injected, the pupil small. The appearance of the eye is so striking that it is in itself almost a certain sign of the disease, and, when joined to the hue and expression of countenance, forms a physiognomy which stamps the affection. Nor do these traits manifest themselves late in the disorder. Frequently, indeed, patients were admitted to the hospital in whom the malady had not reached its sixth day, but whose features bore already the unmistakable impress of the fever. Nay, many a patient applying at the gates, for the relief of unaccountable lassitude and debility, exhibited a countenance which at once proclaimed their real cause. The flush on the face, and peculiar eye, continue during the fever. The former gradually disappears as decided convalescence approaches; so does the suffusion of the eye. The injection of the conjunctiva vanishes, as a rule, before the flush on the cheeks; but in some of the cases it is noted to have been protracted into convalescence.

The *skin* is, as a rule, dry and of elevated temperature, which towards night is increased. But very few cases present that burning, pungent heat which is so much dwelt upon as belonging to the disease. Thus in 16 cases which progressed without complications to a favourable termination, only one, a boy, exhibited the "calor mordicans." Of the others the record says: in 1 considerable heat and dryness of skin; in 4 cases skin hot and dry, in one of which it remained so only a few days, and then is noted as pleasantly warm and supple on the extremities, and hot on the abdomen; in 1 hot but moist; in 7 the expression warm, or moderately warm, or somewhat heated, is used; in 1 the skin was hot and moist, and profuse sweats took place during convalescence; in 1 hot, and its dryness or moisture is not mentioned. The increased temperature does not continue without abatement throughout the whole course of the malady. About the middle of the second week it falls, and the skin begins to lose its dryness. During convalescence it is cool, and desquamation is not unusual. A peculiar and offensive odour is only noted to have occurred in a few instances. In those cases in which complications happened, burning heat of skin is mentioned in a larger proportion. But as several of these complications were visceral, especially pulmonary inflammations, the very great heat of surface is as likely to have been determined by them as by the typhus fever.

The *pulse* is feeble and devoid of hardness. Occasionally it is found to be of good force, though small, even at the height of the disease; yet this is very exceptional. At the onset of the fever it may be strong and full, but it soon loses its strength and volume, and becomes very compressible. A bounding, tense pulse was not noticed in a single instance, no matter what the complication. The cases in which the force or volume of the pulse remained good, all recovered. As regards the frequency of the pulse, it was generally above 100. In twenty-one cases of average severity, not having any special complications, and ending favourably, it reached above 100 in all save three. In nine it was 120; in five between 120 and 130; in two between 130 and 136; in three between 92 and 100; in one 100; in one 88. In this case the pulse, before the fever left, sank to 64, but though so slow, the attending symptoms were those of considerable prostration, and the case was not a light one. The most frequent pulse recorded in the cases not terminating in death was 166. It was accompanied by violent delirium, and by such intense restlessness, that the patient had to be strapped in bed. In all the fatal instances the pulse was above 130; in one it was 156, in another 144. In cases complicated with pneumonia, it reached the latter figure. Great frequency of pulse is, therefore, a bad sign. It indicates either a very severe form of the disorder, or a visceral complication.

The evening pulse is apt to be a few beats more than the morning pulse; but in no case noted did the rise exceed twelve. A decided fall in the pulse is, as a rule, a sign of approaching convalescence. Whilst the malady is at its height, the pulse does not exhibit any marked variations, but as soon as the fever begins to decline, the pulse becomes slower, and often somewhat fuller. This steadiness of the pulse for days is very striking. In a number of instances in which it was carefully observed at about the same hour daily, it scarcely varied by a beat from day to day; its fall was the precursor of a favourable issue, and indeed became an indication of it before any other symptoms pointed distinctly in that direction.

In connection with the pulse, the state of the heart may be mentioned. The weakening of the first sound, and of the impulse, are phenomena as commonly witnessed in this as in other epidemics.

The *eruption* is very constant and significant. It is so constant that I met with it in every well-marked instance of the disease. It was only absent in a few very light cases, the nature of which, moreover, was doubtful. It is not petechial, true petechiæ having been observed only twice in about fifty cases. Its characters may be thus summed up: A reddish eruption scattered all over the body, excepting on the neck and face, most evident on the chest and abdomen, where, indeed, it begins. The spots, when they first appear, are not so dark as those of measles, of lighter hue, indeed, and less coarse than I have often seen them in typhus fever on former occasions. They are of very unequal size; some are quite large, others not much larger than the rose rash of typhoid fever. The larger spots at first disappear, or almost entirely disappear upon pressure, and the change of colour takes place from the circumference to the centre. The smaller spots are less influenced by pressure. Indeed, the larger spots become the smaller, hence the latter are a later development of the eruption than the former. Neither is decidedly elevated, nay, though a slight rise above the skin may be made out, it is difficult to establish, and its occurrence is not free from doubt. After the eruption has lasted a day or two no elevation can be detected; the rash is darker, though still reddish, and far less influenced by pressure. It disappears in part only, and thus it may remain until it fades; or it becomes more fixed, and does not change on pressure. But instances are not unusual in which the spots are very much affected by pressure throughout the whole malady.

A redness of the skin, less defined than the spots described, and lying between them and of a much paler hue, is often met with to a greater or less extent; examples, too, of sudamina are not wanting. The spots are generally very distinct, and may even be recognized in mulattoes. They appear on or about the fifth day, do not come out in crops, and pass away with commencing convalescence, though they may still be sometimes recognized while all the other signs are already betokening rapidly returning health. Of 7 cases admitted into the hospital on the fifth day of the fever with distinct eruption, it had all but faded in 2 on the twelfth day; in 1 only a few traces were to be seen on the fourteenth day; while in 1 it could still be detected, though it was very faint, up to the nineteenth day of the malady, and at least five days after fairly established convalescence. In one case, first examined on the seventh day of the disease, the spots were scarcely visible on the thirteenth; in another, the eruption appeared on the fourth day, was almost gone on the tenth, but could still be traced up to the sixteenth day.

From an early period of the complaint the *tongue* becomes altered, and keeps its unhealthy look to the end of the fever. Early in the affection and at its height the tongue is almost uniformly observed to be coated, though not heavily so, and is usually dry. The coat may extend over the whole organ, but it is not uncommon to find it only on the middle or in streaks, the tip and edges being red. An analysis of 25 cases ending in recovery gives this result: Tongue dry and coated, 7; dry, glazed, and fissured, 1; dry, fissured, and heavily coated, 1; coated and moist, 6; whitish or yellowish coat, red edges and tip, 10. In those embraced under the last head the tongue was mostly dry, and the coating was only heavy at, or was confined to the centre, or existed in light streaks. A blackish crust was noticed in several of the graver cases. In one of these the organ was first smooth and coated and then dry and dark. Moisture and cleansing of the tongue were favourable symptoms preceding convalescence; so was it favourable when the tongue from being dry and coated in patches, became moist and more generally coated. A tremulous state of the tongue is mentioned in a number of the notes of the severer cases just analyzed. In 4 fatal cases the tongue from having been moist became dry and glazed in 1; in 1 it became dry and was with difficulty protruded; in 1 it was at the beginning dry in the centre and coated, but was moist and very tremulous towards the end; in 1 it was moist at the tip and brown and dry at the centre, and tremulous; and in both of the last two cases the tremor was associated with obvious trembling of the lower jaw.

The *loss of appetite* and the *thirst* present nothing peculiar. They occur as in most continued fevers. *Nausea and vomiting* were noted in about one-fourth of the cases. In all they were early symptoms, happening either at the very onset of the disease or in its first days.

As regards the *intestinal symptoms*, it was observed that in 31 cases the bowels were regular, open not less than once in twenty-four hours in 4; sluggish, inclined to costiveness in 5; constipated in 9; decidedly loose in 13. One of the cases included in the second category had at first slight diarrhœa. On the other hand, in two included in the last, the bowels became regular, and in two others costive, before the fever left. In one they were at first bound and then became relaxed; but generally the looseness commenced early in the malady and continued more or less decidedly until convalescence. Those classed as constipated were for the most part such persons in whom it became necessary to resort to injections or laxatives to procure a passage. The diarrhœa, as a rule, occurred in the severer cases. The number of passages varied from four to twelve in the twenty-four hours. They were thin, and small, feculent stools, often offensive, and of yellowish colour. In one instance they are spoken of as having been attended with griping pains.

This is certainly a curious and exceptional state of things. Diarrhœa, so common in typhoid fever, is generally reported to be very rarely met with in typhus. In only 15 cases of 144, says Dr. Murchison in his elaborate work on Continued Fevers, was there any approach to diarrhœa. Here we find 13 out of 31 presenting this symptom in a marked degree: and as this condition formed so often a prominent feature of the epidemic malady under discussion it may not be amiss to record some illustrative cases.

CASE I. *Typhus fever with diarrhœa; four to six passages daily;*

epistaxis; recovery.—Mary H., æt. 14, admitted April 11, 1865, into the Pennsylvania Hospital, bed No. 36, from a district of the city where typhus prevails. Was seized about April 5th with chill, followed by fever, pains in abdomen, vomiting and purging, anorexia, headache and backache. Day before admission had free epistaxis, and the diarrhœa has continued until present time, about six stools daily. Eruption not profuse; generally diffused, though mostly on abdomen; not altered by pressure.

April 12. Pulse 120, feeble. Tongue very dry and lightly coated in centre; eyes suffused and somewhat injected; pupils of good size; considerable heat of skin; bowels opened four or five times; no vomiting; belly meteoric. She is very drowsy, moans, and once or twice has been delirious, getting out of bed; but her answers are perfectly correct and her memory good; voice strong and tone natural. Ordered acid. nitromuriatic. gtt. iv every fourth hour. Whiskey ℥vj daily. Beef-tea.

13*th*. Bowels four times opened; thin, feculent stools; tongue rather less dry; eyes somewhat heavy and injected, but her expression is good and her mind quite active; some dulness of hearing; retains urine a long time; vomited a little yesterday morning; belly slightly meteoric; no ileo-cæcal gurgling or pain; pulse 120, rather feeble; skin hot and dry; sordes on teeth; eruption as before. Increase whiskey to ℥viij.

14*th*. Bowels open five or six times during past twenty-four hours; lies on back during sleep with mouth wide open, eyes not entirely closed; sordes on teeth; head drawn back; pulse 120, small but of better force; pupils normal; considerable thirst; slight cough; eruption as before.

15*th*. Brighter; tongue dryish in centre; bowels opened this morning; pulse 108, gaining force.

17*th*. Expression of countenance very much brighter; tongue soft and slight coat in centre; pulse 84, of good force and volume; bowels opened once in twenty-four hours, stool of moderate consistence, and light coloured; eruption almost disappeared, spots have a brownish hue; stop acid; give four grains of quinia daily.

19*th*. Slightly deaf still; tongue clean and moist; eye bright and intelligence very good; pulse 80; eruption almost gone; bowels regular; appetite good; sleeps well.

20*th*. Rapidly convalescing; bowels regular.

24*th*. Leaves hospital cured; pulse about 80; no cardiac murmurs, though heart's action still much increased by movement or any gastric disturbance; voracious appetite and gaining flesh.

Sometimes, as previously stated, the bowels are at first constipated, but diarrhœa then sets in, and a looseness of bowels remains until convalescence.

CASE II. *Typhus fever with diarrhœa succeeding to constipation; epistaxis; recovery.*—W. P., æt. 28, admitted into the hospital April 4, 1865. Born in Millville, New Jersey; has followed the sea since twelve years of age; last voyage from Wilmington, N. C.; was ashore a good deal at Wilmington. Had occasional nausea, and pain in limbs and head, on voyage up. Was taken ill on March 31st with an imperfect chill, followed by high fever, pain in head, back, and limbs; some pain in abdomen; bowels costive; no epistaxis.

Upon admission, pulse 130, feeble; skin hot and dry; tongue dry and coated; eyes congested; countenance dull; appearance of profound languor; coarse eruption on trunk and extremities. To take acid. nitromuriatic. gtt.

vj every third hour. Beef-tea and milk-punch ℥ij of each every second hour.

April 5. Pulse 124; respiration, 30; eyes still congested; tongue coated and dry in centre, moist along edges; bowels opened twice; epistaxis from both nostrils; hebetude, yet mind seems clear; no appreciable deafness.

6*th*. Slept badly; bowels opened three or four times; stools thin; no more epistaxis; hebetude and drowsiness; eyes still congested; tongue dry, slightly coated in centre; pulse 124, small and feeble; eruption scarce, same as before; mind clear when roused, but expresses wish to die; belly meteoric, neither gurgling nor pain; urine sp. gr. 1022, slightly acid, no albumen, chlorides almost absent.

7*th*. Skin cool; pulse 124, very feeble and small; tongue dry. Whiskey f℥xviij daily; beef-tea continued; whiskey given partly in milk.

8*th*. Intelligence same; bowels opened several times; passes water freely; pulse very small and feeble; eruption still visible; abdomen meteoric; urine sp. gr. 1022, slightly acid, chlorides very deficient, no albumen; urates in casts. Whiskey f℥xxiv.

9*th*. Drowsy, but more easily roused; pulse 111, gaining strength; tongue less dry; hearing better; eyes still suffused and congested, with small pupils; passes urine; bowels opened quite frequently; no subsultus; no tinnitus. Tr. opii gtt. xxx by injection.

10*th*. Drowsy; bowels opened about three times during night; skin pleasantly warm on extremities, hot on abdomen; pulse 102, much stronger; belly meteoric; eruption very scarce, but still visible; passes his urine voluntarily; no cough; eyes less injected; tongue dry; flapping of veins of neck.

11*th*. Heavy, disposed to sleep; tongue less coated, dry and smooth at tip; moist at edges; eyes injected, pupils small; skin moderately warm; pulse 100, of good volume and increasing strength; belly tympanitic; bowels quiet; eruption visible; urine sp. gr. 1020, acid, chlorides increasing, no albumen, urates. Face has a bloated appearance. Reduce whiskey to f℥xviij.

12*th*. Less heavy; hearing good; eyes less injected; no cough; belly slightly meteoric; pulse 88, good volume and force; tongue cleansing and moist at edges.

13*th*. Less heavy; eyes still slightly injected; skin warm; tongue only dryish, and clean; bowels opened three times last night; pulse 80, compressible; eruption still visible; pulse 66 at 11 o'clock, of fair volume; urine of sp. gr. 1011, acid, abundant chlorides, no albumen; no abnormal deposit.

14*th*. Eyes clearer; complains of feeling dull; tongue dry and glazed in centre; bowels opened four times since yesterday, the stools becoming consistent; sleeps a great deal, but when aroused, mind is active; belly of normal shape; skin pleasantly warm; pulse 81, small and compressible; only a trace of eruption. Acid twice daily, and quinia gr. vj daily. Reduce whiskey to f℥xv.

15*th*. Pulse 78, compressible; tongue dryish; skin supple and moderately warm; intelligence good when he is aroused, answers being correct, but he is very drowsy; belly normal.

16*th*. Bowels opened three times; pulse 66, of good volume and force; tongue moister, with patches of soft coat; intelligence good; eyes clear; eruption scarcely visible.

17*th*. Intelligence good; tongue clean and soft; belly rather flat, with a few traces of eruption; pulse 75; bowels opened two or three times; good appetite, not much thirst.

21*st*. Sitting up; rapidly gaining in every respect.

In the following case the diarrhœa formed an even more prominent feature of the malady, and persisted also throughout the attack:—

Case III. *Typhus fever with diarrhœa from onset of disease; bowels remained loose during its whole course; epistaxis; recovery.*—J. S., æt. 21, admitted into the Pennsylvania Hospital April 28, 1865; born in Philadelphia; a sailor—last trip from Delaware Bay. Felt prodromes of this attack about eight days ago; pain in head and back; flushes of heat; anorexia; epistaxis. Since Tuesday last he has been confined to bed; the epistaxis was repeated, bowels opened five or six times daily, with occasional griping pain in stomach, also prostration, and considerable sweating.

On admission, skin was moderately warm, inclining to moisture; tongue coated, but moist; pulse of fair force though small; belly meteoric with distinct eruption; eye slightly congested, pupil rather small; cheeks flushed. Acid. nitromuriat. gtt. vj every four hours; two oz. of beef-tea and milk-punch every two hours. During night, as bowels were frequently opened, gtt. xxxv tr. opii by enema were given, and after that he slept quietly.

April 29. Face flushed; intelligence very good; quite loquacious; eye very slightly injected, pupil normal; tongue heavily coated, yet is moist; considerable cough, white mucous sputa; skin warm—moisture on forehead; pulse 96, of fair volume, but compressible; belly slightly meteoric; no pain or gurgling; eruption scattered all over body, most marked over hypochondria; slightly elevated and much modified by pressure. Urine sp. gr. 1005, chlorides almost absent, no albumen, very pale, slightly acid. Respiration harsh, with coarse, dry, and moist râles postero-inferiorly.

30*th*. Coughs considerably with white mucous sputa; face very much flushed; capillary circulation rather stagnant; eye clear; pupil normal; skin cool; tongue coated, inclining to be dry; some epistaxis yesterday afternoon; bowels opened ten times since yesterday morning—thin, yellowish stools; pulse 80—compressible. Eruption quite copious, coarse, much darker than tâches rouges. Many of the spots almost disappear under pressure, but some of them are quite persistent. Whiskey increased to f℥xij. Tr. opii gtt. xxx by enema; stop acid., give quinæ gr. xij daily.

May 1. After injection yesterday bowels were not opened until night, during which, however, he had about three very large thin stools. This morning pulse 96, rather small and feeble; intelligence very good; hearing fair; some tinnitus aurium; eyes clear, pupils normal; respiration attended with coarse, dry, and a few moist râles, and harsh murmur over postero-inferior part of both lungs; belly becoming scaphoid; eruption very distinct; spots dark, and very many of them do not disappear under pressure; urine sp. gr. 1014, chlorides almost absent, no albumen, slightly pale, almost neutral, no deposit; tongue moist, slightly coated; lips cracked. Tinct. opii camph. f℥j with aq. camphor. f℥ij, to be taken when bowels are loose.

The subsequent progress of the case was marked by a gradual decline of the diarrhœa, which, if not arrested, was kept in check by the paregoric. On the 5th of May, the patient was rapidly gaining strength. The eruption was much faded; the bowels had been opened four times in twenty-four hours. After that the bowels, though slowly becoming more regular, remained loose during his entire convalescence, which, on the whole, progressed favorably. Soon after the 12th of the month he left the hospital.

While engaged in analyzing the frequency and character of the stools, some other abdominal symptoms, such as meteorism, pain, and gurgling, may be inquired into. *Meteorism* was observed in fully one-third of the cases. In 30 cases its existence is noted in 11, in the remainder the state of the abdomen is indicated as normal, as supple, or is not specially mentioned. Though in all the cases in which the symptom is spoken of it was well-marked, and the abdomen unnaturally full, in no case did the tympanitic distension reach extreme limits. *Gurgling* was not encountered in a single instance, at all events, there is not a single record of its occurrence, and in very many of the notes its non-occurrence is distinctly stated. *Abdominal pain* and tenderness were rare symptoms, and when met with, the tenderness was never great nor limited to any particular spot. In one case its seat was chiefly epigastric.

Cough is very commonly present. It existed in fifteen of twenty-eight cases, not counting those in which it was associated with pneumonia. It is generally connected with bronchitis, and is found to coexist with coarse, dry, or moist râles; and with a slight though tenacious mucous expectoration. In several instances the catarrhal condition of the bronchial tubes preceded the fever. The cough is rarely very frequent, nor is it a source of annoyance. It may be conjoined to more or less hypostatic congestion of the pulmonary tissue, and then the percussion resonance is decidedly impaired. But hypostatic congestion was also noticed when no cough or expectoration happened, and did not reveal itself except by the physical signs—the altered percussion note, the harsher, more bronchial breathing, or the persistent crepitating râles.

The *respiratory movements* are usually somewhat accelerated. At the height of the febrile malady they are apt to range from twenty-four to thirty-two, even in cases in which there are no chest symptoms. In one patient, however, they never rose above twenty-two, though his pulse beat from 108 to 120. The breathing is, as a rule, regular, and, indeed, normal in all save its frequency, unless there be a pulmonary complication. In some cases the rapid respiration forms a prominent feature, and may even be attended with a comparatively slow pulse. This happened in a man twenty-seven years of age (Richard P., Bed 28), who had much subsultus, delirium, and tube-casts in the urine, whose pulse was of fair volume and force, and ranged from 88 down to 64, though the respirations were forty in the minute.

In this curious case, which ended in recovery, the frequent respirations were not due to any discoverable morbid condition of the lungs. Nor were they in the following, in which the pulse bore a more normal proportion to the respiratory movements:—

Case IV. *Typhus fever; shallow respirations, forty in the minute;*

great prostration and muscular tremour; recovery.—P. B., æt. 30, a labouring man, admitted into the Pennsylvania Hospital, April 24th, 1865, lives at 21st and Shippen Sts. Felt symptoms of attack seven or eight days ago, viz., violent pain, especially in back of head and small of back; cough, with tough mucous sputa; vomiting and looseness of bowels; has become rapidly prostrated.

April 25. Considerable hebetude and some deafness, though answers are correct when his attention is fixed; face uniformly flushed; eyes suffused, with small pupils; tongue dryish and coated; sordes on teeth and lips; considerable muscular tremour, with slight subsultus; bowels opened freely two or three times; urine free, sp. gr. 1019, acid, chlorides almost absent, no albumen, amber colour, deposit of rosette phosphates, granular urates, few fragments of tube-casts; skin hot, with a copious coarse rash over whole surface, except face, but most marked on thorax and abdomen, the large spots somewhat modified by pressure, the small ones scarcely at all; pulse small, compressible. Ordered milk-punch and beef-tea every second hour; acid. nitromuriatic. gtt. vj every fourth hour. In the afternoon, as the pulse had increased in frequency, the amount of whiskey was increased to f℥j every hour, and toward midnight, the pulse being still more compressible and feeble, and 120 in minute, and the tongue very dry and tremulous, the amount was further increased to f℥iss every hour, and the acid given every three hours.

26*th.* Expression somewhat better, though still dull and heavy; eyes suffused, pupils small; yet intelligence is perfect, though slow; occasional cough; respirations very shallow, 40 in minute; a few moist râles at posterior lower part of lungs; skin hot, and inclining to moisture; pulse 108, very compressible; tongue dry, brownish, and fissured, though not deeply, and tremulous; no muscular tremour or picking of the bedclothes; some sordes on teeth; bowels opened twice; eruption very abundant, and some mottling of trunk; decided odour; cardiac impulse feeble; first sound very feeble; urine sp. gr. 1013, acid, chlorides very deficient, slight amount of albumen, amber colour, urates, and tube-casts.

27*th.* Expression heavy, dull, and fixed; very slight deafness; eyes much congested; pupils small; face flushed and hot, inclining to moisture on forehead; tongue well-shaped and moist at edges, but thickly coated and very dry and fissured in centre; some sordes on teeth; no muscular tremour, and tongue less tremulous; cough very rare; respiration still very frequent and shallow; belly meteoric; no pain nor gurgling; bowels opened twice during night; urine sp. gr. 1011, rather more chlorides, opalescent by heat and nitric acid, pale colour; eruption as before; mottling of trunk less distinct.

28*th.* Much improved; intelligence quicker; hearing better; pulse 95, gaining force; heart sounds more forcible; skin cool and soft; belly large, tympanitic; bowels opened twice; urine very free; respirations about 32, fuller; eye much clearer, pupils still small; tongue less tremulous, becoming moist; eruption as before, large spots still very much modified by pressure, but spots are smaller than before, and mottling of trunk less distinct; nose bled a few drops; urine 2210 cubic centimetres, sp. gr. 1014, alkaline at end of twenty-four hours, very deficient in chlorides, no albumen, deposited heavily phosphates, radiating urates, some epithelium, and a few small tube-casts.

29*th.* Pulse 92, and gaining strength; expression better; face has nearly lost its flush; eye less injected; tongue still heavily coated and slightly tremulous; belly large, supple; bowels opened twice; skin moderately warm; eruption fading; slight cough; some sordes on lips and teeth; spots much smaller and less distinct, small ones do not disappear under pressure, large ones disappear under forcible pressure, and both are influenced by pressure, though eruption has already passed its height. Whiskey reduced to f℥xv daily.

30th. Expression much better; less flush of face; tongue less coated, very tremulous; skin warm, supple, moist on trunk; pulse 72, of good force and volume; bowels twice opened; eruption very much faded; whiskey reduced to f℥xij; urine (April 30th to May 1st), total quantity 1100 cubic centimetres, depositing urates and phosphates, sp. gr. 1022, chlorides increasing, no albumen, light amber.

May 1st. Drowsy; eye clear; face looks somewhat emaciated, as the flush has disappeared from cheeks; considerable cough, but slight expectoration, and no marked râles; tongue moist, tremulous; belly large; eruption nearly gone; pulse 83, of fair force; eruption on back but little modified by pressure; bowels twice opened.

2d. Pulse 80, gaining force; tongue moist and clean, and but slightly tremulous; eruption losing its distinctness; eye clear; mind rapidly becoming more active; but little cough.

In the case just detailed the respirations were more specially deranged in frequency. But they may be at the same time noisy, without there being any signs of a pulmonary lesion, none certainly save congestion, and that not sufficient to account for the hurried and very much altered breathing.

Case V. *Typhus fever; great prostration; respiration* 50 *and noisy; death.*—Matilda W., native of Ireland, æt. 28, admitted into the Pennsylvania Hospital, Feb. 11, 1865, had been sick about four days. On admission the symptoms were as follows: Tongue slightly coated in streaks; moderate heat of skin; pulse 94; coarse spots influenced by pressure, though not quite disappearing on pressure, found plentifully dispersed on chest, and abdomen, and extremities; headache, but mind seems perfectly clear; bowels somewhat loose; no pain on pressure in iliac fossæ; two passages this morning.

Feb. 12th. Pulse 100; about the same in other respects. Acid. nitromuriatic. gtt. iv every four hours; to be sponged twice daily with vinegar and water, and cold water applied to head.

13th. Pulse 104; face flushed this morning; tongue still red, perhaps redder than it was, and still yellow streaks on each side of centre; two watery stools last night. In the evening pulse 116

14th. Pulse 108 to 112, very compressible; eruption still plainly visible; mind clear; throat and tongue dry, of brownish colour. Ordered ol. terebinth. gtt. x every four hours; 1 oz. beef-tea every three hours. P. M., pulse 124; very restless; constant desire to get out of bed; mind duller; turpentine to be given in ℥ss of camphor water; ℥ss whiskey every second hour.

15th. Pulse 116; tongue dry; still some headache, but mind clearer than last night; continue turpentine, and whiskey in milk, also beef-tea every two hours. 7 P. M., pulse 132; skin very hot; necessary to use bandages to keep her in bed; bowels open to day; passes her urine well.

16th. Pulse 116 to 120, has more volume; tongue still dry, but moister than yesterday; mind clearer; seems to answer with more readiness; eruption still distinctly visible; mutters to herself in low tones; not much heat of skin; bowels open to day. Ordered f℥ss whiskey every hour till evening, then ℥j every second hour; continue beef-tea, milk, and medicines, except acid. Afternoon the tongue was again very dry, and protruded with difficulty; and the pulse feebler.

17*th.* Did not sleep during the night; took her food and whiskey regularly, and without trouble; pulse 124, feeble; tongue protruded with difficulty; appears to be rational in some answers, but is very feeble and constantly muttering; counter-irritation in the shape of sinapisms continued to back of neck; whiskey every hour till evening. At 6 P. M. pulse 124, remains of very feeble volume; respiration 50, noisy; no dulness on percussion anteriorly; no marked auscultatory signs anywhere, except a few coarse râles on left side; bowels moved three times this evening; heart sounds decidedly feeble; so is impulse; whiskey has not increased pulse since noon; continued 1 oz. whiskey every hour, also the turpentine and turpentine stupes to back of chest. At midnight pulse very feeble, 140; whiskey somewhat diminished, six drachms every hour, but ten drops of chloroform every two hours; the turpentine was stopped for the night; nourishment given as freely as possible.

18*th.* 1½ A. M. pulse very rapid and feeble; feet, legs, and arms were cold; warm water to feet; mustard plasters to legs, and teaspoonful of ether internally. 8 A. M. pulse still feeble, if any change fuller. Urine of acid reaction, containing a small quantity of albumen, normal amount of chloride, great excess of urates; phosphates, if at all changed, are diminished; tube-casts somewhat granular and coated with epithelial cells. Took 1 oz. whiskey at 10 A. M.; pulse 148, still feeble; body covered with moisture; breathing still very rapid and shallow; some impairment of resonance at back of right lung, with a few coarse râles; no bronchial breathing; mind, if anything, duller; face flushed; whiskey continued ℥ij every two hours, with 4 grs. quinia every two hours, and also a mixture of chloroform and alcohol. In the afternoon pulse 152 to 156; no change in breathing, still very frequent and noisy, is perhaps fuller than in morning; the same slight impairment of resonance over back of right lung, with a few coarse râles; no bronchial breathing; mind duller; face flushed, covered with sweat. In the night breathing somewhat more difficult, still very feeble; is gradually growing worse; pulse still about 152; whiskey was diminished to see if the pulse would fall, but there was no marked change; returned to her former allowance.

19*th.* A. M., 4½ o'clock, died.

Autopsy thirty hours after death.—Subject very fat. *Blood* dark colour; utter want of clot; deficient in fibrin and in red globules. *Brain* normal consistence; membranes congested; veins filled with dark blood; no appearance of an effusion into the ventricles or any other part of brain; brain structure everywhere healthy. *Lungs,* no sign of exudation at base; congested; back of right lung is more heavily congested than any other part, though lower lobes of both lungs markedly congested; portion of right lung sinks imperfectly in water, but is readily inflated, showing only congestion and some collapse; no exudation. *Heart* average size, but softer than normal; softening not found to be associated with any microscopical changes; fibres very well marked. *Spleen* enlarged, and darker hue than normal. *Liver,* nutmeg liver, congested, and slightly fatty. *Kidneys* larger than normal; tubular structure intensely congested. *Intestines* healthy; no disease of Peyer's gland; may be some congestion, and very slight prominence.

The very rapid feeble pulse, the great prostration scarcely influenced by the most active stimulation, the mind so clear at first, then becoming very dull, and the heightened noisy breathing gave to this case striking features. The peculiar condition of the respiration can certainly not be solely accounted for by any changes in the lungs. It is more purely a nervous phenomenon occurring in patients whose nervous systems have been overwhelmed by the fever poison. It may be a question whether the congestion of the lung sometimes associated do not become combined with collapse (as in Case V.), and thus the noisy breathing be explained. But if it be so, what causes the collapse? Certainly not the extent of secretion, which is slight; much more likely the enfeebled nervous forces. A further question suggesting itself is whether the presence of albumen in the urine of the last two cases be more than a mere coincidence; whether the impeded secretion of the kidneys likely to have been occasioned did not react upon the already enfeebled nervous centres, and thus give rise, or at least aid in giving rise, to the altered breathing? Another example of this kind of noisy breathing is afforded by a case further on reported (Case IX.), in which the kidneys were considerably affected, in which retention of urine happened, and in which, though there was pneumonia, the state of the lungs could not by itself explain the character of the breathing.

Urinary Secretion.—The urine was found to vary much in quantity and colour in the observations that were made. It is high coloured at first, but may become quite pale as convalescence begins, depositing an abundance of urates and phosphates. In several cases, far advanced in the fever, it was retained. In no case did its specific gravity reach above 1023; while 1014 to 1017 were much more common; 1010 was the lowest noted. As a rule, it preserved its acid reaction; but in several cases it was neutral, and in a few it was alkaline, or at least became so within twelve hours after it was voided. In most of the cases the chlorides were entirely absent or reduced to a trace; in some they remained normal; and in one they were plentiful throughout. During convalescence they return, but the specific gravity does not of necessity rise; it may even fall during their reappearance.

Albumen was detected in 8 out of 21 cases in which the urine was examined daily, or nearly daily, for this ingredient; but in one of these cases it may have been owing to previous renal disease; in another it was only discovered in one examination, and was a mere trace; in none was it really very abundant. The cases in which it was met with, with perhaps one exception, in which the most minute quantity was present, were severe cases, and among the eight cases there were four deaths, or, if we reject the case alluded to where it is probable that the kidneys were previously affected, three in seven cases proved fatal. But it cannot be said that in those exhibiting albuminous urine any very special prominence of delirium or stupor was observed. Yet I do not doubt that when the quantity of albumen is large, and the secreting power of the kidneys much disturbed, that the want of power of elimination on the part of these important organs still further vitiates the blood and may show itself by more marked stupor or coma, by increased delirium, or even by convulsions, and under any circumstances the existence of albumen proves the blood to be considerably disordered, and must be taken into account in explaining the phenomena of a case and in determining its treatment.

Along with the albumen, and in repeated instances without it, tube-casts were found; the microscope also exhibited renal as well as vesical epithelium in the deposit with some of the salts of the urine. The tube-casts were in marked cases of the disease more often present than absent. They were either coated with rather opaque epithelial cells, many of which were finely granular, or were hyaline, or covered with granules, which, as Dr. Pepper, who tested them with reagents, informs me, were sparingly soluble in acetic acid, and which, with very high magnifying powers, did not present the round shape of oil. They are probably the urinary salts collected on the tube-casts, which themselves are an indication of the altered blood, and of the congestion and disturbed nutrition of the kidneys.

The extreme and early *loss of strength* is a very constant and characteristic feature of the malady. In some instances the patient was able to drag himself to the hospital, though he had reached the fifth day of the fever; but, as a rule, those admitted, even when they had been ill but a few days, could scarcely walk, and had been obliged to keep their beds from the first manifestations of the disease. The extreme debility persists throughout the complaint; and though it is not uncommon to find the patient very restless, and attempting to get out of bed, yet any appearance of strength he may show is fictitious, for, left to himself, he is very apt to fall to the ground, or to stagger back to and sink exhausted on his bed.

The loss of strength is generally greatest in those who exhibit marked tremulousness of the hands, or indeed of any part of the body. Sometimes the prostration may increase so rapidly as to lead to complete collapse.

Case VI. *Typhus fever; delirium; sudden collapse, with huskiness of voice, similar to cholera; death.*—Edward L., æt. 25, admitted into the hospital April 10, 1865. Born in Philadelphia. After leaving college, at the age of 19, went to sea, and has served as supercargo on numerous long voyages. Two months ago a slight hacking cough commenced. He has had a chancre, followed by bubo in left groin, but has never noticed any secondary symptoms. His present attack came on five days ago with fever, headache, vomiting and purging, sore throat, and a diffuse papular eruption. The papules, he states, became vesicular, desiccated, and desquamated. But the preceding lines are all very doubtful, as he was far from being rational.

April 11. His eyes, which were slightly injected yesterday, are markedly so to-day. Tongue clean. Complains of frontal pain, but seems rational, save that he frequently expresses a desire to be buried in sand, to cure a diarrhœa which he says he has. There is an eruption visible on the chest and abdomen; some of the spots being much modified by pressure, whilst others were hardly at all influenced; some spots were also seen on the arms, feet, and legs, but not so many as on the chest and abdomen. There is slight muscular tremour. Skin warm, but not hot. Belly meteoric. Pupils of moderate size; react to light, though not very actively. There are râles, dry and moist, none very fine, over back of lungs, but scarcely so many as when admitted. Some râles, with jerking, prolonged expiration, under right clavicle, and percussion note is less resonant there than under left. Heart-sounds normal as regards murmurs, but first sound is deficient. Pulse 120, and feeble. No vomiting. Bowels have not been opened since admission into hospital. Ordered liq. ammoniæ acet., aquæ camphoræ, āā f℥ss every fourth hour; beef-tea f℥ij every second hour; and a few ounces of whiskey in the shape of milk-punch.

P. M. Inability to void urine, which was drawn off; sp. gr. 1019; good quantity of chlorides; albumen in small amount, merely causing an opalescence; deposit contained granular epithelial casts, phosphates, with refracting granules. Some whiskey given during night, and beef-tea.

12th, 7 A. M. Found him in state of partial collapse. Hands blue and cold. Radial pulse scarcely to be felt. Tremulous movement of lower jaw, with a peculiar hoarseness or huskiness of voice, like the vox cholerica. Bowels have not been opened. External heat and stimulating frictions were immediately applied, and f℥iss whiskey given every hour until 10 A. M.; after that he took f℥j every hour, one hour with f℥j milk, the next with f℥ij beef-tea. No reaction, however, occurred. The eruption became much more copious. The urine, which was drawn off, was of sp. gr. 1013; chlorides almost absent; no albumen; but same microscopical appearances. The extremities remained cold, despite most powerful frictions and stimulation. Ordered f℥xxiv whiskey daily, and f℥j sp. chloroformi every second hour. Bowels were not opened. Belly meteoric; no gurgling, but he seemed to feel pain in iliac fossa. Huskiness of voice increased. Mind grew more and more heavy, and patient difficult to rouse. He died at 3 A. M., April 13; surface becoming very cold some time before death.

Autopsy seven hours after death.—Considerable cadaveric rigidity. Body much emaciated.

Thorax.—Lungs crepitant throughout, but deeply congested in lower lobes posteriorly. Heart healthy; contained small soft black clots. There were firm adhesions of pleural surfaces, especially on right side.

Abdomen.—Very little fat. *Liver* enlarged, congested, perhaps a little more fat than normal. *Spleen* very much enlarged, about thrice normal size; not very pulpy; containing no abnormal nuclei. *Intestines* presented some prominence of Peyer's glands, and congestion of mucous membrane, but no ulceration. The mesenteric glands were but slightly enlarged. *Kidneys* congested, with some tubes filled with granular epithelium and masses of granular urates.

Brain was healthy, not even congested. It was thought that the olfactory nerve was rather tough.

Blood was collected from right iliac vein, consisting of soft black clots and of fluid dark blood. The clots had numerous little white points on their surface, which proved to be aggregations of white corpuscles. The fluid blood contained *patches* of white corpuscles, which, when treated by acetic acid, cleared up, showing one, two, three, or four nuclei.

Headache is a symptom rarely absent. It is found among the prodromes of the fever, or exists during the early period. It is referred either to the forehead or the back of the head. In not a single instance was it noted to have been acute or paroxysmal; and very rarely, indeed, is it intense, or more than a continuous dull aching. It does not last throughout the fever, and only during the first week of the malady does it form a distinct feature of the disease, or is apt to be complained of.

As in most epidemics of typhus, so in this, the mind is more or less affected, and *stupor* and *delirium* are common. But in a large number of cases the stupor is not very decided; there is rather sluggishness of mind, and at no time does the patient, when aroused, fail to give a correct and connected answer. Of 24 cases, in which the state of the mind was specially noted, there existed delirium in 10; in 8 dulness of mind and stupor were prominent symptoms; in the remaining 6 the mind was not confused, but remained clear, although perhaps not so active as in health. The *delirium* is generally quiet, more often muttering than active or noisy. In 4 of the 10 cases it was combined with great restlessness, and in one of these—and all were severe, though none fatal—the patient was delirious, talked and screamed, and tried so persistently to get out of bed that bandages had to be used to restrain her; in another the mental wandering was attended with very great restlessness at night, in fact with utter sleeplessness; in the third the patient moved about a great deal in bed, and once or twice left it; and it was much the same in the fourth. Sometimes the mental state and the character of the wandering are very peculiar. The extraordinary delirium of Case VI., who gave a very detailed and connected account of the symptoms prior to his illness, which undoubtedly was utterly incorrect, and whose real mental condition revealed itself by the constantly expressed wish to be buried in the sand, for the cure of a diarrhœa which did not exist, has already been mentioned. In another patient the mind appeared clear and the intelligence good; she seemed to have a perfect cognizance of her condition, answered any questions rationally, but, as evening came on, became restless, got out of bed, and was in a state of intense nervous excitement, expressing herself as having committed sins which could not be pardoned, descanting on the general consequences of sin, and the Almighty's mercy. These hallucinations occurred two nights in succession.

The delirium was in only one case, and that a somewhat doubtful one, noticed at the very beginning of the malady. It generally comes on in the second week, as the headache passes off. It is not in itself a dangerous symptom. It was present in 3 of 5 fatal cases; in 1 the delirium was muttering, associated with stupor gradually deepening into coma; in 1 the delirium, too, was muttering, but the patient was still capable of being aroused on the morning of the day he died; and in 1, a case (Case VI.) just described, the peculiar state of mind continued until collapse occurred.

In the remaining 2 of the fatal cases the mind was dull and stupid in one; the other one presented the extraordinary phenomenon of its remaining clear to the last hours of life.

CASE VII. *Typhus fever, with great prostration: mind remains clear; hiccough; husky voice; death.*—William W., coloured, a sailor, æt. 35, admitted into the Pennsylvania Hospital, April 10, 1865. No history could be obtained, excepting from the answers he himself could make. According to his own account, he had suffered for eight days from pain, cough, diarrhœa, and anorexia.

April 11. Suffusion of both eyes, with small pupils; bowels freely opened six times daily; tongue coated, dryish; pain in stomach, which is meteoric; mind clear, though sluggish; pulse 120, feeble; constant hiccough. He was freely nourished and stimulated from the first, taking beef-tea f℥ij every two hours, and f℥xij whiskey. He was also placed upon acid. nitromuriatic. gtt. vj in aq. camphoræ f℥ss every four hours.

12*th*. Last night, finding the hiccough continue, an opium suppository of gr. j was introduced, and he was put upon the use of chloroform gtt. v every two hours. This morning he still hiccoughs, though less than before the suppository and chloroform were given. Pulse is small, 124; tongue dry in centre, and coated; skin less hot; bowels six times opened since yesterday. Urine had to be drawn off, and was found to be of sp. gr. 1023, acid reaction, chlorides almost absent, and with a decided, though small amount of albumen; it was of high colour, and deposited granular and hyaline casts, and granular epithelium. Towards night, as the hiccough obstinately persisted, ol. succini gtt. v every three hours was ordered; the whiskey was increased to f℥xviij daily.

13*th*. Tongue slightly coated, moist, and very tremulous. Hiccough continues, but less violent, and apparently somewhat influenced by treatment. He has had three passages since last night, one involuntary this morning. Urine still requires to be drawn off by catheter, and is of sp. gr. 1020, high colour, acid reaction, chlorides very deficient, and a small amount of albumen. Pulse 144, very small and feeble. Extremities very cold. Ordered quiniæ sulph. gr. xvj in divided doses, and increased whiskey to f℥xxiv.

14*th*. Rapidly sinking. Constant tremulous movement of lower jaw and tongue. Hiccough has almost ceased. Eyes are fixed, with but little expression, and yet mind seems clear, although he appears nearly in articulo mortis. Involuntary discharges both of urine and a thin yellow fecal matter. Pulse extremely feeble, and too rapid to count. Respiration very rapid and shallow. Abdomen meteoric. Extremities as cold as if he were dead. Towards evening vomiting came on. For past 48 hours there has been a peculiar huskiness of the voice, which increased so long as he was able to articulate. These ominous symptoms aggravated through the night, the intense coldness of extremities advanced towards trunk, the pulse grew more and more thready and rapid, deglutition became impossible, and at 12 M., April 15, he died.

Post-mortem examination five hours after death.—Marked cadaveric rigidity. Body not much emaciated, though features were singularly pinched.

Head.—No congestion of vessels of scalp or calvaria. The large veins over convexity of brain filled with dark blood. Brain substance apparently healthy. No abnormal effusion into ventricles, nor thickening of membranes.

Thorax.—*Lungs* were crepitant throughout; much congested in posterior part of lower lobes. *Heart* of good consistence; contained several clots, those in auricles being soft and dark, whilst in left ventricle there was a tough, very irregular, fibrinous clot.

Abdomen.—*Liver* somewhat enlarged and congested; when examined under microscope, the cells were found to have preserved their nuclei in every case, and contained no excessive amount of fat. There were firm adhesions between convex surface of liver and under surface of diaphragm. *Stomach* was of average size; exhibited a somewhat thickened condition of its walls, especially the mucous surface, and a marked enlargement of the villous coat towards cardiac extremity. *Spleen* was about half as large again as in health, dark, and soft. *Kidneys* were of normal size, somewhat congested, and in one or two parts presented a decided decrease of the tubular portion. When examined minutely, the Malpighian bodies and capillaries were found to be only moderately congested; but the epithelium contained an abnormal amount of granular fat, and in places the tubes were clogged with granules. *Intestines.*—Considerable dark congestion of colon; congestion of lower portion of small intestine; with enlargement of solitary glands, and congestion, though not tumefaction, of many of Peyer's patches.

The *blood* was dark, either fluid or forming soft dark clots; contained an abnormal number of granular corpuscles, which, when treated by acetic acid, revealed from one to four nuclei. The red corpuscles were crenated, and did not form themselves properly into rolls.

Irrespective of the singular state of mind of this patient, the hiccough requires to be noticed. This is a very rare symptom in typhus fever, and generally happens only in the gravest examples of the disorder. But it is doubtful whether it can in this case be attributed to the febrile malady. To say the least, the organic disease of the stomach and the adherent diaphragm, neither of which appeared recent, acted as predisposing causes.

Deafness was noticed to exist, to a greater or less degree, in 8 out of 21 cases, 2 of which proved fatal. It may or may not be connected with buzzing in the ears. It could not have been, as has been suggested with reference to the occurrence of this symptom, due to quinia, since, at the time it was observed, the patients were not taking this medicine. In 5 of the 8 cases there was coexisting delirium; of the other 3 the mind was sluggish in 1, very dull (and the deafness in this case was very great) in 1, and in 1 it was little if at all affected, though here, too, the deafness was very marked.

Epistaxis is scarcely regarded as a symptom of typhus fever. Most writers barely allude to it as among the possible signs of the malady; few have met with it. Yet in this epidemic it occurs in about one-fourth of the cases, the same proportion in which Jacquot encountered it during the Crimean war. I have noted it in 8 of 31 cases. In only one was it profuse. It took place in all excepting one during the earlier part of the disease, though in one it recurred almost to the end. In 1 it lasted during one day, and the blood came from both nostrils; in 2 the nose bled repeatedly, and at intervals of several days. The cases in which it was found were the graver ones. In 6 of the 8 there was also diarrhœa.

The frequency of epistaxis is all the more remarkable from the rarity with which other hemorrhages happen. I have not as yet seen a single instance of hemorrhage from the bowels or the gums. Nay, even sordes on the teeth and lips, due as they so often are to slight admixture of blood with the cast-off epithelium, were not unusually common.

Complications.—The most ordinary complications observed in this epidemic are *pneumonia, erysipelas,* and *parotid swellings;* others, too, occur, such as *pharyngitis* and *gangrene of the feet,*[1] but these were met with but in single instances, while several of the former were encountered.

True pneumonia was seen in 3 out of 32 cases. In two of these it was limited to the posterior lobe of one lung, and there was coexisting bronchitis of the other; in the third case it was double, or to speak more accurately, it affected, as true lobar pneumonia, one lung, while the other showed only signs of partial consolidation, with marked hypostatic congestion and bronchitis.

Case VIII. *Typhus fever complicated with double pneumonia; recovery.*—Mary T., mulatto, æt. thirteen, the daughter of a man who had just left the hospital convalescent from typhus, was admitted on March 3d, 1865. She was taken sick, February 24th, with headache, pain in breast, diarrhœa, bad taste in the mouth, and anorexia. When admitted, on the seventh day of her illness, her symptoms were: headache, but no pains in the limbs; great heat of skin; six to eight watery discharges from the bowels; tongue coated with a whitish coat; flush on both cheeks perceptible through the dark skin; injected eyes; slight cough; pulse 118, and rather feeble. Was ordered plumbi acetat. gr. ij, every sixth hour; beef-tea six oz., and milk freely.

March 5. Tongue still coated; diarrhœa better, only two passages last twenty-four hours. 7 P. M., pulse 128; continue pills.

6*th.* Pulse 132; no passage since yesterday morning; tongue coated, but less so; restless, almost sleepless night; eyes not so suffused or injected. Two oz. of whiskey daily, added to her milk diet.

7*th.* Pulse 136; coughs a little; one passage since yesterday morning; skin cool; mind wanders; tongue still slightly coated, yellowish-white, substance unaltered, perhaps redder than usual. Urine sp. gr. 1020, acid reaction, the merest trace of albumen, more perceptible with nitric acid and heat than with nitric acid alone or heat alone. Ordered whiskey increased to 4 oz. daily; acetate of lead pills stopped; ol. terebinth. gtt. x every fourth hour.

8*th.* Complains of much pain on pressure in the right iliac fossa; bowels not opened for two days; 9 A. M. pulse 140, feeble; 6 P. M. pulse 144.

9*th.* Mottled spots, some darker than others, found principally on chest and abdomen, little, if at all, influenced by pressure. General abdominal tenderness, but tenderness more marked perhaps in the right iliac fossa; tongue clean; delirious during the night, but better this morning; pulse

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[1] Case for which amputation of the leg was performed at the Pennsylvania Hospital, and described by Dr. Andrews in July number of this Journal, 1864.

124. Ordered poultices medicated with laudanum to be applied to abdomen; whiskey increased to ℥vj; turpentine continued.

10th. Pulse 112; bowels opened twice by a teaspoonful of castor oil; sleeps well; tongue cleaning; less pain in abdomen; flush visible on cheeks; cough, which has been slight all along, is now marked; tenacious, but not rusty-colored expectoration; the respirations have become frequent, 40 to 42, and there is great dulness with tubular breathing on right side posteriorly, no dulness anteriorly; fine crepitation at the back of left lung; left cheek seems most flushed; tongue moist, losing its coat. Ordered, in addition to previous treatment, quin. sulphat. gr. ij four times daily in a mixture of spir. eth. nitr. and syrup prun. Virg.

11th. Pulse 111; respiration 48; percussion dulness still marked on right side; distinct tubular respiration; vocal fremitus increased on right side; fine crepitation still heard on left side; urine of dark amber colour, acid reaction, sp. gr. 1022, no albumen, a slight diminution of the chlorides. Ordered turpentine stupes and poultices to be used; continue whiskey six oz. daily in milk, and beef-tea.

12th. Pulse 112 to 118; respiration 46 to 48; only slight impairment of resonance on left side, with some crepitation and imperfect blowing respiration. On the right side crepitation is now becoming rather coarse, and tubular breathing less well defined; flush on left cheek is still more distinct than on right; complains of pain on pressure on right side of abdomen; mind clear; tongue clean and moist, yellowish-white coat.

13th. Pulse 104; respiration 36 to 40; tubular breathing losing its distinctness; râles increasing, somewhat coarser in right lung; sputum adherent, but not rusty-coloured, and in small quantities.

14th. Pulse 102; respiration 26 to 28; tubular respiration losing its distinctive character; sputum tenacious, rather thicker than yesterday.

16th. Pulse 104; respiration 28; dulness very much disappeared; breathing lost its tubular sound; sputum less tenacious, and is more copious.

17th. Pulse 88; respiration 28 to 30; only slight impairment of resonance still perceptible at lower portion of left lung and middle of right; few coarse moist râles with vesiculo-bronchial respiration on right side; no tubular breathing; flush on cheek disappeared; cough diminishing.

19th. Pulse 108; tongue still slightly coated, but patient is convalescing.

21st. Pulse 104. Reduce whiskey to two oz. daily.

22d. Pulse 96; respiration becoming more and more vesicular and normal; strength increasing.

30th. Discharged well.

In this case the inflammation of the lung succeeded gradually to the hypostatic congestion. The pulse remained for some time, and probably as the exudation was taking place, at upwards of 140; this phenomenon was equally observed in another patient, a girl of ten years of age, treated too with quinia and turpentine, and in whom recovery also took place. The same fortunate result did not happen in the following case, a man of fifty, but who, in addition to the pulmonary complication, had previously existing disease of the heart and kidneys.

Case IX. *Typhus fever; diarrhœa; pneumonia of one lung; bronchitis and congestion of other; noisy breathing; retention of urine; death.* —George L., æt. 50, admitted April 11, 1865. Born in Bucks County, Pa.

Seaman. Has been dull and feeble for a week, with some frontal pain and general soreness; anorexia; bowels opened twice daily; had a decided rigor about a week ago; coughed occasionally, with mucous expectoration; no epistaxis; a little pain in abdomen.

April 12. Tongue dryish, with very light fur; papillæ prominent and distinct. Pulse 120, of fair volume, but compressible. Eyes suffused, with small pupils. Belly large and meteoric. Bowels opened three times during night; thin passages. Mind perfectly clear. Considerable cough. Eruption on abdomen. Treatment, acid. nitro-muriatic. gtt. vj every fourth hour. Beef-tea and milk-punch.

13th. Eruption over chest and abdomen; a few doubtful points on arms; some on legs. Those of lightest red are very much modified by pressure; they appear coarser and larger than typhus fever eruption ordinarily is. Bowels loose; two or three passages during night. Cough, with few bronchial moist râles on left side. No dulness on percussion. Tongue moist and slightly coated. Pulse 120.

14th. Pulse at least 120; intermittent. Respiration 36. Tongue coated and dry in centre; rather moist toward edges. Bowels opened twice; small, thin passages. Urine free; sp. gr. 1015, acid, deficient chlorides, considerable albumen, blood, granular epithelium, crystalline casts, with few tube casts. Eyes suffused; pupils small. Belly large but supple; eruption as before. Coughs considerably, with mucous expectoration. Excessive feebleness of heart's action. Pulse irregular in rhythm, occasionally dropping a beat, and the beats varying in duration. Coarse, moist râles over left side anteriorly, and posteriorly low down. Harsh blowing, but not true tubular; breathing heard over right scapula. Ordered quiniæ sulph. gr. xvj daily in two-grain doses. Whiskey f℥xviij. Beef-tea and milk continued.

15th. Delirious; muttering, but readily roused, and, when questioned, answers correctly. Tongue moist. Pulse 122; very compressible. Some dulness of hearing. Belly large and supple. Eruption same. Bowels opened four times; stools of mush-like consistence.

16th. Passed a restless night. Respirations 40. Pulse 130. Tongue moist at tip; brown and dry in centre. Considerable muscular tremor, and constant trembling of lower jaw. Bowels opened once, not a formed stool. Retention of urine; when drawn, is of sp. gr. 1015, alkaline, deficient chlorides, considerable albumen, fragments of casts. Dulness on percussion posteriorly on right side, and harsh blowing respiration mixed with large râles. A good deal of cough with tenacious sputum. Eruption same. Toward night he became much worse. Deglutition was impossible. Pulse very rapid and full. Retention of urine continued. Respiration laboured, noisy inspiration, with puffing expiration. Urine drawn off. Ordered beef-tea and one ounce of whiskey by enema every two hours.

17th. Condition unchanged. Is too weak to discover condition of lungs. Has had one passage from bowels, and passed some urine at same time, but about f℥x were drawn off. Unable to protrude tongue. Pulse very feeble—over 130. Belly large and supple. Respiration 45, with same characters as last night. Skin only moderately warm. Entirely unable to speak, but looks at you when spoken to. Ordered beef-tea and whiskey continued; quinia gr. vj every six hours; also beef-tea f℥ij, yelk of one egg, f℥iss whiskey every three hours by enemata. Died at 12 M.

Autopsy.—Blood diffluent; numerous white corpuscles.

Heart dilated; fibres pale, granular, and friable, with abundance of free fat.

Lungs. The posterior part of right lung was dense, and it was found to sink in water. Left lung congested but not consolidated.

Kidneys large; somewhat congested; cortical portion much increased; very granular casts in tubules.

Intestine showed congestion of colon, and prominence of the solitary glands, with some congestion and prominence of Peyer's patches, but not the least appearance of deposit or ulceration.

Erysipelas is a serious, but not necessarily fatal complication. In none of the cases observed did it occur excepting on the face. It appeared as the fever was approaching its termination, or even after commencing convalescence.

CASE X. *Typhus fever, complicated with erysipelas; repeated epistaxis; parotid swelling; death.*—John C., æt. 23, admitted into the hospital April 1, 1865. Seaman; made his last voyage from Liverpool to New York; came directly to this city after landing. About two weeks ago, while boarding in a house in Pine Street, was, to use his own language, on a drunken spree, and while recovering, felt the prodromes of the present attack—languor, headache, &c. Since that time he has been confined to bed. Has had considerable diarrhœa (ten stools daily); repeated epistaxis, principally from right nostril; total anorexia; great prostration; frontal headache; vomiting about a week ago. The stools have been very fluid and offensive.

Condition shortly after admission: Tongue moist and clean; skin hot; countenance dull, with congestion of both eyes; answers are slow but correct; slight deafness. Pulse 114, feeble. Respirations accelerated. Cough, with mucous expectoration, and with fine râles over lower posterior part of both lungs. There are a number of spots over surface, some of which he ascribes to an attack of scabies which he had some time since.

April 2. In the same condition. Has had two stools, dark and consistent. Respiration 18. Pulse 108. Coughs considerably. Eruption is a coarser red, not much influenced by pressure, and most abundant on abdomen. Has taken beef-tea and milk-punch, āā f℥ij every fourth hour. Quiniæ sulph. gr. viij daily.

3d. Intelligence about the same. Eyes still congested; pupils small. Respirations heavy, 20 in the minute. Pulse compressible, 112. Tongue clean but dry; some sordes on lips. Has had quite a free epistaxis this morning. Eruption same as yesterday. Much less cough. Bowels opened once; stool feculent, rather soft, and light-coloured. Urine sp. gr. 1011, acid, no albumen; deposit of premature epithelium and a few mucous corpuscles.

4th. Pulse 114. Tongue coated and dryish. Eye still congested. Eruption the same. Bowels opened twice during night. Pupils small. Occasional cough, and fine, dry râles at postero-inferior part of lungs.

5th. Pulse 120; rather feeble when sitting up. Bowels opened frequently and copiously. Tongue dry and coated. Mind tolerably clear. Eye still suffused. Eruption still very visible. The same amount of whiskey, ℥viij to ℥x daily in milk; beef-tea and quinia continued.

6th. Dull and drowsy. Skin less hot. No more epistaxis. Pulse 112, compressible. No subsultus. Eyes suffused, but less injected. Tongue very dry; black crusts in centre. Sordes on lips. Rare cough. Belly normal. Eruption same. Bowels open three times during night, once this morning.

There are a few dry and moist râles over posterior part of left lung below ridge of scapula. One of cervical glands at right angle of jaw is swollen. Urine, sp. gr. 1012; chlorides almost absent; no albumen; light flocculent deposit.

7th. Much the same. Still dull and stupid. Pulse 108, of deficient volume. About four passages in twenty-four hours.

9th. Heavy and drowsy. Tongue moist and well-shaped. Bowels opened three or four times during night. Pulse 100. Eyes less congested. Stop acid, and give tr. terebinth. gtt. x every fourth hour in mucilage. Skin moderately warm. Urine free. The small abscess at right angle of jaw has opened and discharged freely. Ordered tr. opii gtt. xxx by injection late in day. Discharge from left ear.

10th Eye almost clear; pupil small. Tongue dry. Respiration 22. Pulse 108, large, but quite compressible. Skin moderately warm and moist. Bowels opened about twice during night, passages being watery, with normal-coloured fluid fœces. Little cough. He has been occasionally delirious since yesterday morning, and is very dull. Lungs are full of snoring and cooing dry râles, and large moist râles. Turpentine stupes; tr. opii gtt. xxx by injection.

11th. Dorsal decubitus. Face rather pinched. Eyes sunken; conjunctivæ clear; pupils rather small. Skin inclining to be cool. Tongue dry and glazed. Pulse 108, large, but compressible. Slight dulness of hearing. Belly meteoric. Bowels less frequently opened; ochre-coloured fluid stools. Lungs less full of râles.

12th. Less hebetude and deafness. Tongue not so dry and coated. Eye clearer. Belly still meteoric. Bowels are freely opened. Skin pleasantly warm. Coughs considerably, but rather less. Pulse 108, of good volume, and more force. Slight purulent discharge from left ear. He has vomited occasionally in last few days. Urine, sp. gr. 1017, no chlorides, decided albumen. Free fat, granular epithelium, hyaline tube-casts, and entirely granular casts.

13th. Bedsore forming over sacrum. A large external pile has also appeared. Bowels freely opened three times during night. Tongue moist and clammy; quite clean; sordes. Belly flat; no gurgling or tenderness. Pulse 96, compressible. An erysipelatous blush has appeared over bridge of nose extends to malar bone on each side, with some tumefaction. Still coughs. Mind dull, but not restless or delirious. Urine of last night sp. gr. 1013, alkaline, chlorides almost absent, no albumen, pale amber, globular urates, and triple phosphates. Increase whiskey to f℥xviij. Apply sulphite of soda locally—solution of gr. xv to f℥j aquæ Give turpentine every three hours. 12 grs. quinia daily. Towards night he vomited occasionally.

14th. It is with difficulty that the application can be kept in place on his face, but it has been renewed constantly. Erysipelatous redness and swelling have extended about an inch in every direction. Bowels opened four times, passages being thin. Skin cool. Pulse 105.

15th. Tongue glazed and dryish. Skin moderately warm and dry. Pulse 105, large, but compressible. Bowels opened five or six times very copiously. Erysipelas has not extended on left side of face, but on right side it has advanced to ear, and there is also hard swelling of right parotid. Argent. nitrat. gr. x to f℥j to part.

16th. Another attack of epistaxis. Bowels opened five times; passages but moderately thin. Belly meteoric. Tongue soft, with patches of white coat. Eyes clear. Hearing very dull. Pulse 108, of fair force. Right parotid very much enlarged. Some puffiness over left angle of jaw.

17th. Bowels opened several times. Urine free. Gums not spongy; no salivation. Perfectly deaf, but intelligence seems good. Eyes brighter. Tongue clean—merely dryish. Belly scaphoid. But little cough. Pulse 108, fair volume and force. Swelling at angle of jaw increased; tense and elastic; no signs of fluctuation.

18th. Intelligence good, although he is very drowsy. Tongue clean and moist. Pulse 96. Belly flat. No passage since early morning. Right parotid still very large; somewhat elastic, but not very hard. Right ear discharging freely. No enlargement of left parotid. Right parotid is even less hard than yesterday. Fomentations applied, but not steadily kept up. Erysipelatous redness is much less distinct.

19th. Less deafness; intelligence good. Tongue clean and soft. Pulse 104, gaining strength. Skin moderately warm. Bowels freely opened. Erysipelas almost gone. No desquamation yet. Right parotid much less hard in front of ear. Discharge from ear continuing. Respiration noisy; at one time only 15 in minute; entirely through his nose. Bedsore over sacrum.

20th. Pulse 130; small and feeble. Considerable vomiting. Bowels freely opened three times. Skin moderately warm. Belly retracted. Eyes clear. Very great deafness. Free discharge from right ear. Right parotid less tense. Tongue dry; somewhat glazed. Vomiting ceased toward night. Stop turpentine. Erysipelas returning. Ordered ferri perchloridi gr. $\frac{1}{4}$, every second hour; other treatment continued.

21st. The night-nurse reports that he has had no vomiting. Has taken his stimulus and medicines well, but at 8 A. M. he appeared to suddenly fail. His countenance was nearly hippocratic. Pulse very small, 132 in minute. Hands cool and clammy, although remainder of surface was warm and dry. Bowels thrice opened; small, thin passages. Belly scaphoid. Right parotid much diminished in size, discharge from ear continuing. Last night he got out of bed, climbed on table, and fell violently on floor. He steadily sank after this, and died at 10 A. M.

Autopsy six hours after death.—*Brain* healthy. *Thorax.* Lungs deeply congested postero-inferiorly, especially on right side. No pleuritic adhesions nor effusion.

Liver large, very pale, with yellowish tinge, and on examination, cells found to be very fatty. *Spleen* but slightly enlarged and quite firm.

Kidneys pale, and, when examined, some tubes were seen, with their epithelium, cloudy and granular, though the majority were typically healthy.

Intestines. Some congestion of large bowel; in small intestine, Peyer's patches were rather prominent, and there was some enlargement of the solitary glands, but not the least irregularity or sign of ulceration. The mesenteric glands were considerably enlarged, pale and firm.

Blood was dark and fluid; contained about three times as many white corpuscles as in health, which inclosed two and three nuclei. The red corpuscles were evidently unhealthy, as there was no perfect formation of rolls, and the colouring matter was too easily dissolved out by water. The bladder contained a considerable amount of urine, which was amber-coloured.

Upon laying open seat of parotid, it was found that the gland had suppurated, discharging itself through ear.

In this case the erysipelas was associated with *parotid swelling,* itself a not unfrequent and a dangerous complication of the fever. This complication happened in 5 out of 50 cases, two of which died. In one it affected merely one gland, in four, both. The former case recovered; and so did two of the latter. In one of these, a boy, 14 years of age (R. B.), the swelling was enormous. It appeared, as indeed these swellings usually do, just as the fever had begun to decline. Various local means were tried to backen the tumefaction, or cause its absorption—iodine, belladonna, mercurial ointment, a freezing mixture—but all in vain, they had no effect. The glands both suppurated; and suppuration was favoured by fomentations and poultices. The first discharge came through the ears, and the glands were subsequently opened. The following is a similar instance:—

Case XI. *Typhus fever with parotid swelling; absence of chlorides from the urine; recovery.*—Sallie McG., æt. 7, living in a neighbourhood from which numerous cases of typhus fever have been brought to the hospital, was admitted April 3d, 1865. Imperfect history only could be obtained; has been sick about nine days (according to her sister's account she was only sick for two days, then grew much better, was up, and relapsed). She now presents: sordes on teeth; eyes suffused and watery, slightly injected; tongue dryish, imperfect yellow coat; skin moderately hot; pulse 120; bowels inclined to be loose; mind quite clear; eruption general, not very distinct. Ordered acid. nitro-muriatic. gtt. iij every fourth hour. Ol. terebinth. gtt. v every fourth hour, beef-tea, and milk.

April 4. Dull; cheeks flushed; eyes slightly injected; tongue moister; bowels costive; pulse 120; eruption indistinct; urine sp. gr. 1015, acid, no albumen, chlorides absent, no deposit.

5*th*. Brighter; eyes less injected; tongue becoming moist; urine retained for twenty-four hours, sp. gr. 1016, acid, chlorides absent, no albumen.

6*th*. Brighter; eyes scarcely injected; tongue moist, slightly coated; urine passed freely; bowels costive; pulse 104, gaining strength; good appetite. There is no hepatization of lung to account for absence of chlorides; she has an occasional hoarse cough, which is apparently tracheal.

7*th*. Cries a great deal, owing to an inflammation of the gland near right angle of jaw; passed an uneasy night; has had an ounce of oil, but bowels have not been opened; tongue well shaped, moist and clear at edges and tip, coated in centre; passes water freely, and drinks a great deal of water; appetite poor; sordes on teeth and lips; pulse 120, small, but of good force; respiration 22 to 24; no blowing respiration, breathing can scarcely even be called harsh; percussion note clear. 8 P. M. The swelling at angle of right jaw has involved right parotid, anterior part of neck, and glands at left angle. Urine sp. gr. 1014, neutral, no albumen, normal colour. Ordered acid stopped, quiniæ sulph. gr. v daily, sol. argenti nitrat. gr. x to f℥j applied locally.

8*th*. This morning the swelling seemed a little less, but toward night it has increased; pulse 124; tongue slightly coated; bowels opened; child less restless, but still cries a great deal; urine neutral, sp. gr. 1014, chlorides returning, but urine merely rendered opalescent, no albumen, normal colour.

9*th*. Passed a better night, but is restless again this morning; tongue moist with white fur in patches; pulse 95, of good force; bowels opened; swelling on left side less; right eye is closed, but there is a decrease in swelling of right parotid; urine sp. gr. 1009, chlorides still very deficient, no albumen.

10*th*. Tongue soft and moist; swelling both of parotid and of neck very much diminished; bowels costive; some appetite; on left side swelling has almost disappeared, on right side the gland is tumid; she allowed for the first time a poultice to remain through night; gland is painful to pressure, but less resistant; no eruption visible, but here and there a slight discolouration of the skin.

11*th*. Tongue soft and moist, with patches of white fur; pulse 95; urine sp. gr. 1017, chlorides increasing, no albumen, deposit of urates; but little appetite; bowels opened once by f℥ss ol. ricini; her expression is much better, and she is brighter and less peevish; there is no longer any swelling on left side, while on right it has much diminished anteriorly, so that she can open the right eye without difficulty; but just in front of ear and at angle of jaw there is still considerable swelling. On examining fauces, the right tonsil and wall of fauces project considerably into throat, forming a firm, elastic, non-painful tumour, which, however, does not interfere materially with deglutition. The solution of nitrate of silver was applied externally night and morning until last night; no application being made this morning; there is not the slightest salivation; urine sp. gr. 1017, neutral, or nearly so, no albumen, chlorides increasing, urates.

12*th*. Free discharge from right ear; integument is purplish and tense below and in front of mastoid process; passed a very restless night, crying with pain; pulse 85; skin cool; bowels regular; tongue clean and moist; urine sp. gr. 1017, marked increase of chlorides, no albumen.

13*th*. Left side presents no abnormal appearances, even small glands have gone back to natural size; discharge from right ear increased; swelling seems to point below ear, with distinct fluctuation; abscess opened freely by incision; urine sp. gr. 1017, slightly acid, abundant chlorides, no albumen, deposit of uric acid, granular matter.

14*th*. Abscess under right ear has discharged freely a thick pus; tongue soft and clean; pulse 90; appetite fair; she is very peevish and fretful, moaning constantly.

15*th*. Pulse 96; skin cool and soft; tongue clean and moist; abscess discharging freely; appetite fair.

16*th*. Abscess discharging freely and rapidly diminishing.

18*th*. Abscess discharging freely and a considerable amount of slough has become detached; child is much emaciated, and very nervous.

29*th*. A considerable portion of gland appears to have been discharged; suppuration ceased April 24th; since then the hole left by separation of slough has been filling up; child's strength and appearance very much improved; gums firm, and there has been no salivation; appetite excellent; runs about all day. In this case the nitrate of silver did not seem to have caused the least diminution or recession of the swelling—certainly not on the side almost wholly affected.

Here, too, the discharge came first from the ear, and the gland specially affected suppurated. This, in my experience, is the most desirable termination. Were it not that to go here more fully into detail would prolong this paper to limits ill-suited to the pages of a journal, many cases might be added, observed on other occasions, to show how little likely it is that absorption of the exudation will take place, and how apt parotid swellings are then to end in death. I do not refer so much to one-sided tumefaction, which always presents a far more favourable prognosis, but to those in which both glands are involved. When such cases terminate fatally the parotid glands are found to be swollen and hard; on section a glairy fluid exudes from them, in which the microscope finds many granules, some granular nucleated cells, but very few pus-globules.

There is one more complication which I may notice, that in which *contraction and rigidity of the muscles* and very marked *cerebro-spinal symptoms* happen. I observed this in one striking instance. But let the case speak for itself.

CASE XII. *Typhus with rapidly occurring muscular rigidity and opisthotonos; death.*—Timothy S., a mulatto, age 22, who had been in the surgical wards of the hospital for upwards of a month, was transferred for chills and fever to the medical ward on Feb. 29, 1865. Notwithstanding that he took twelve grains of quinia daily, he had several successive chills recurring at about the same time of day, but otherwise there was nothing noticeable about his condition. He ate his food and appeared as well as usual.

On the 6th of March he complained of feeling sick at his stomach, for which he was allowed some lime-water with whiskey; and he was placed on milk and broth, and eggs as diet.

He continued feeling sick all day of the 7th; was listless, indisposed to talk, nor did his answers seem as rational as usual. Towards evening he became very restless, is stated to have spoken incoherently, and was constantly getting out of bed, running round the ward and disturbing the other patients; so restless in truth was he that at a very early hour on Friday morning he was fastened to the bed by the nurse.

When examined on the 8th, at the morning visit, he was found to be comatose, and his head drawn back. His eyelids were wide open and remained so; the pupils reacted sluggishly; the bladder was emptied by a catheter; the urine contained not a trace of albumen, but a large quantity of urates and phosphates; the pulse was feeble and very frequent. He remained much in this condition all day, seemingly hearing when spoken to, but taking no notice; with his eyes wide open, and a film from secretion covering them; the pulse did not change much, it was about 140; the first sound of the heart was almost extinct. But what was most striking was the position of his body. He lay with his head drawn very much backwards; his extremities rigid; the abdomen contracted; in fact there was complete opisthotonos, and the whole body could be raised by placing the hand at the back of the head and lifting it. He was stimulated as freely as possible, taking at one time six ounces of whiskey in the space of four hours; turpentine, ten drops every second hour, and carbonate of ammonia were also given; and as towards evening there seemed to be difficulty in swallowing he was nourished through a stomach tube.

On the 9th he was much in the same condition, occasionally he would mutter a few words and seemed brighter, but there was no real improvement in any of his symptoms; the pulse was very rapid; and his urine, owing to inability to void it, was repeatedly drawn off by the catheter. No paralysis of the limbs existed; and no eruption could be discerned on his dark skin. In the evening he died.

Autopsy sixteen hours after death.—*Brain* of firm consistence, and healthy appearance of brain structure; it was very slightly congested, as was judged by a fair number of red points being visible in the sections. The vessels of the membranes were moderately full of dark blood. But nowhere was there the least sign of an opacity, or of exudation. Normal amount of fluid in ventricles.

Spinal cord was also of firm consistence and healthy appearance, and its membranes were only slightly, if at all injected.

Thoracic viscera: Lungs pale, anæmic looking; heart normal consistence, pale colour.

Abdominal viscera: Kidneys, spleen, and liver seemed healthy; bowels contracted, and some *post-mortem* intussusceptions; but mucous coat normal.

Blood dark looking, coagulated imperfectly.

In this extraordinary case, in which the *post-mortem* examination threw no light on the cause of the gravity of the symptoms, there were the most obvious cerebro-spinal phenomena; so obvious that the case will by many be looked upon as one of "spotted fever." But it happened in a man who had been for weeks in the hospital, and who was in a ward in which there had previously been several typhus fever patients, and where the nurse not long afterwards was seized with an attack of the fever, which proved also rapidly fatal. Yet, though I believe the disease to have been typhus fever to which either in consequence of the influence of the poisoned blood, or of the direct effect of the poison on the cerebro-spinal system, peculiar features were imparted, I have not included the case in the analysis of any of the symptoms made in this paper, so as not to vitiate the results arrived at by what might be regarded as a doubtful illustration of the malady.

Anatomical Lesions.—The lesions detected have been mentioned in connection with the fatal cases; but we may here briefly group them together. The most constant and significant change is the altered condition of the *blood.* It is much darker and more fluid than natural, and either perfectly diffluent or forms soft, black clots. It contains an increased number of white corpuscles, and the red are for the most part crenated and do not properly shape themselves into rolls. The white corpuscles inclose from one to four nuclei, which become readily apparent on the addition of acetic acid.

In no instance was any sign of inflammation of the *brain* discovered, or did the brain-substance itself look other than healthy. There was no effusion into the ventricles, nor was even congestion of the membranes a constant feature: in only a few instances were the veins on the surface filled with dark blood.

The *lungs* are commonly in a state of hypostatic congestion, yet crepitant. They are susceptible of inflation, though with more difficulty than in a healthy condition, and when inflated their dark colour disappears to a great degree. Portions of them may sink in water and be condensed by collapse, as in Case V., or consolidated by exudation, as in Case IX.

A markedly softened condition of the *heart* was only observed in one case, if we except Case IX., in which the morbid cardiac phenomena were very likely caused by disease prior to the fever.

Enlargement of the *spleen* is the rule, and the organ is usually darker and softer than in health. But there are no abnormal elements in its pulp.

The *kidneys* are generally congested; though a marked exception to this is reported in Case X. The tubular structure is clogged with epithelium, with tube-casts, and with granules, probably the urinary salts which collect on the tube-casts.

As much of the interest of the cases turned on the enteric symptoms, the *intestines* were in every fatal case very carefully inspected; and not in one was there the least appearance of a deposit in the solitary glands or in Peyer's patches, or of softening or ulceration of these structures; in other words, not a single case presented anything like the peculiar lesions of typhoid fever. Congestion of the lower portion of the small intestine, or of the colon, was the most common condition, and the solitary glands were more or less congested, and looked somewhat swollen and prominent; and when examined microscopically were found to be filled with blood. But we must recall the fact that severe diarrhœa was of usual occurrence in the fatal instances of the fever, and that the prominence of the glands was no more than is met with in many blood diseases, such as in smallpox and scarlatina. The same may be said of Peyer's patches, which were more distinctly marked than they normally are, and which in four out of the five cases presented little black dots interspersed in the patch and seemingly limited to, or at least more evident in, the small glands composing the agglomeration. This appearance, which has been likened to the shaven beard, was seen, when minutely investigated, to be dependent upon a reddish-brown pigment occurring in coarse granules of much lighter colour at the circumference than at the centre, or in aggregated masses of these. The pigment is uninfluenced by acetic acid. An enlargement of the mesenteric glands, though not a very great one, was noticed in two cases.

Duration and Mortality.—The duration of the complaint is, like that of any continued fever, difficult to determine, nor is perfect accuracy attainable. But fixing the commencement of the disease from the chill, or the coming on of headache, pain in the limbs, and heat of surface, and dating the convalescence from a brightening of the mind and countenance, a decided decrease in the pulse, a diminution in the temperature of the skin, a fading eruption, returning appetite, and increasing strength, the fever does not last three weeks. Only in very severe cases, or where complications have arisen, does it pass into the third week. This was the duration in 19 uncomplicated cases which terminated favourably :—

In 2 cases . . .	12 days	In 2 cases . .	17 days
" 1 case . . .	13 "	" 1 case . .	18 "
" 3 cases . . .	14 "	" 1 " . .	19 "
" 3 " . . .	15 "	" 1 " . .	20 "
" 4 " . . .	16 "	" 1 " . .	21 "

Thus in about two-thirds recovery had fully set in before the seventeenth day of the disease, and only in one did it tarry until after the twenty-first.

Recovery was not indicated by a sudden and marked change in the symptoms; the fever reached a certain point and then declined, without, as a rule, anything that could fairly be called a decided crisis taking place. Yet it must be stated that in several instances it was distinctly noticed in those patients in whom the bowels had been regular or costive, that one or two large, even loose, passages happened at what proved to be the turning point of the illness; and the changes in the urine have already been alluded to. As a rule, convalescence was rapid, and not interfered with by any untoward events. The greatest inconvenience of which patients complained was pain in the calves of the legs, and particularly in the soles of the feet, constant, yet much worse at times than at others, attended with some soreness on motion and on pressure over the muscles, and seemingly a muscular hyperæsthesia.

The *mortality* of the cases that receive attention from an early period of the malady, is, considering its nature, not very great. Out of 39 patients under my charge in the Pennsylvania Hospital 5 died (not including Case XII.). The fatal cases have all been reported in full in this paper. It will be seen that excluding Case IX. from consideration, a man who would probably have succumbed to any acute affection, the deaths were in two instances due to complications rather than to the fever, and in two more strictly to the fever itself. In one of these (Case V.) death happened on the twelfth or thirteenth day of the disease. In the other (Case VII.) on the twelfth day.

But though the proportion of deaths does not appear to be so large as it generally is in typhus, the data here given are insufficient for calculating accurately its rate of mortality. The disorder shows all grades of the fever; and in accordance with the preponderance of one or the other, the death-rate will vary. I have seen, both in and out of the hospital, a number of very light and a number of very grave cases.

Treatment.—In discussing the treatment of the affection, I shall not attempt to apply the numerical method of analysis which has been chiefly followed in this inquiry. Whatever be its merits in regard to therapeutic knowledge, and I do not propose to discuss this vexed question here, it is very evident that to prevent fallacious inferences, especially where comparative methods of treatment are tested, the conclusions must be drawn from an extended series of cases, much more extended than that forming the basis of this paper. Nor will it be necessary to discuss in full the treatment pursued in all the complications which arose, for the cases reported will for the most part indicate what that was. I shall therefore mainly present an outline of the plan followed in the majority of the cases, and which seemed to me to be most advantageous, with the exception of mentioning some points which may not be readily apparent in the narratives here given, or which have not been touched upon.

And first, of the *hygienic* treatment. This was carried out by the most careful attention to ventilation, to cleanliness, and to diet. The fever cases were, as far as was practicable, placed in a large room by themselves, and never more than four together, and the windows, even when the weather was cold, were kept open. The patients were sponged thoroughly morning and evening with vinegar and water, and not permitted to get out of bed. The diet consisted mainly of beaf-tea, broths, and milk. The morning and evening meals were composed of as much milk and arrowroot as was relished; at dinner a bowl of chicken soup was given; and in the intervals, strong beaf-tea, or milk, generally in the form of milk-punch, was administered every two hours. In some cases they were given one shortly after the other, in others alternately every hour, and in a few instances even oftener, according to the amount of prostration attending the case, and to the patient's digestive powers. But, as a rule, he was allowed to rest for two hours at a time, and strict directions were given not to awake him at night, unless the case were very urgent, when the time for his nourishment came, but to let him sleep, if possible, three or four hours, and then to give him more than the usual quantity of food and stimulus. The average amount of beaf-tea taken at a time, was two ounces, or about one pint and a half in twenty-four hours; though some took considerably more than this. Water was very commonly craved as a drink, and was never denied.

As regards the treatment by *medicinal* means, these were mainly stimulants, the mineral acids, particularly nitro-muriatic acid, turpentine, and, during convalescence, quinia, or the vegetable bitters. Stimulants were very generally administered; yet simply to sustain the vital powers, and though in some cases upwards of twenty-four and in others at least eighteen ounces of whiskey were given in the twenty-four hours, it was with no view of giving alcohol as food, nor of following out what is known as the stimulating plan of treating fevers, but simply because that quantity seemed necessary to check the tendency to death by exhaustion. Nor was delirium looked upon as a contra-indication to the administration of the stimulus; on the contrary, when associated with a very frequent pulse (as in M. D., Bed 34), a cessation of the cerebral symptoms, and a very decided fall in the pulse followed its free use. At times the condition of the patient was such that he had to be freely stimulated even from the onset; but this treatment was ordinarily avoided. Either no whiskey, or only a few ounces were given during the earlier days of the fever, and the quantity increased as the symptoms, such as more evident weakness, or trembling, or profuse discharges, or some depressing local complication, seemed to demand that increase, but not sooner. Six to eight ounces in milk-punch (one-third of whiskey and two-thirds of milk), and in divided doses by day and by night, was the average amount employed in the twenty-four hours; and its influence chiefly on the fulness and frequency of the pulse taken as the test whether to exceed this dose; so long as the pulse did not lose in volume and rise, it was not increased. In one case, making an excellent and speedy recovery, and in which there was delirium with a rather full pulse, not a drop of alcohol was given until the patient was far advanced in convalescence. But the character of the typhus, which is clearly of the adynamic type, renders, for the most part, free stimulation a necessity.

Nitro-muriatic acid was more commonly employed than any other medicine. It was given in from 3 to 5 drop doses of the officinal acid, diluted in water. In not one instance did it appear to interfere with the milk diet of the patients, and seemed to be rather agreeable to them. It was sometimes given conjointly, or rather alternately, with turpentine, especially in cases presenting pulmonary complications; though the more common practice, when complications occurred, or distressing symptoms had to be relieved, was to stop the acid, and meet the indications. Most of the complications, the pneumonias and parotid swelling, were treated by turpentine and quinia. In the pulmonary affections, the turpentine was used both internally and externally. Quinia was not prescribed in simple cases of the fever, excepting in a few in which it was given in small doses combined with the acid. But, as already stated, during convalescence it was generally administered, and it was sometimes then combined with iron.

Purgatives were not employed, owing to the frequent existence of diarrhœa; yet, in cases in which constipation was present, laxatives were occasionally administered, or the bowels were kept open by enemata. Bearing in mind the fact that, just as the fever declines, free passages happen, it is a matter of advantage to act on the intestinal canal about that period. The treatment of the diarrhœa requires a good deal of care. If the patient had but two or three passages daily, and was not particularly prostrate, no attempt was made to check them. But when this became desirable, laudanum enemata, or acetate of lead by enema or by the mouth, either alone or joined to opiates, was found sufficient for the purpose, except in some cases in which the looseness of the bowels resisted opiates and astringents as stubbornly as it does at times in typhoid fever. In severe cases of diarrhœa the acid treatment was stopped; so was it often when vomiting took place, a symptom which was always found to yield to the admixture of lime-water with the milk.

In cases of much delirium, or prostration and trembling, chloric ether was several times given with apparent advantage, though these cases were for the most part met by an increase of alcoholic stimulants. Restlessness and insomnia were treated with small doses of morphia, and with camphor-water, or Hoffmann's anodyne. But in severe cases chloroform proved the most efficient remedy, either alone or given with camphor. This was strikingly shown in a lad 15 years of age (E. B.), who was utterly sleepless, very restless, and delirious. On the second evening of this state of things five drops of chloroform were given in a tablespoonful of camphor-water every second hour. After the fifth dose he grew calm, and slept quietly; his delirium, too, was favourably influenced by the continuance of the medicine, and the pulse declined from 116 to 110. The next evening he took four doses of the preparation, and passed a quiet night; but subsequent to this the morbid phenomena returned, yet again yielded to the remedy.

For the relief of the headache, cold applications to the head and sinapisms to the nape were usually employed, and they seemed ordinarily to produce the desired effect.

In bringing this paper to a conclusion, a few words on the general nature of the fever, and on some points which, bearing on the question of its prevention, are even of larger meaning than a study of its symptoms and treatment. The disorder has occurred at all seasons of the year, and, though now waning, is still encountered. During the hot months of summer comparatively few cases happened. It is seen in children as well as in adults, and is not confined to any particular locality or class of persons; and though its greatest ravages take place in the southeastern part of the city, and in localities which, from their overcrowding and filth, would be apt to propagate the fever poison, cases are met with—it is true, not many—among those living in well-ventilated houses and in every comfort. The malady is, beyond all doubt, contagious. Several instances of those nursing the sick taking the fever, and even dying in consequence, have come under my notice; while in others slight fever, headache, and gastric derangement were observed, without the supervention of actual typhus, but clearly owing to the absorption of its poison. And when once in a house, more than one case is apt to follow. It was, indeed, not uncommon for whole households to apply in succession at the hospital; but, so far as could be investigated, in not a single instance was a case of typhoid and of typhus admitted from the same house. What its origin, whether imported from across the water and taking root in this soil, or generated here, is difficult to determine. Its occurrence at the time of a vast war, and typhus being the fever which is known to decimate armies, would naturally lead to the belief that it was brought from camps to cities; but typhus fever was scarcely one of the diseases of the American army, certainly not of any portion from which soldiers would have been apt to have been sent to this city. And its prevalence over so many parts of the world, in a more than usually aggravated form, lends colour to the belief that it has been brought here, or, at least, that our typhus constitutes part of that general typhus epidemic which is so wide-spread. That it presents characters of its own, should it really be found to be dissimilar to that prevailing in other countries, may be owing to local influences; for why can we not assume that diseases may be thus altered, and, if the expression be admissible, domesticated? Whether it is to become a permanent inhabitant, or pass away, time only can solve; but wherever it has shown itself—and I believe that it has been seen in many of our cities—the most stringent hygienic regulations ought to be enforced.

ART. II.—*On the Cause of Intermittent and Remittent Fevers, with Investigations which tend to prove that these Affections are caused by certain species of Palmellæ.* By J. H. SALISBURY, M. D., Professor of Physiology, Histology, and Pathology in Charity Hospital Medical College.

ALL views upon the origin of malarious diseases, up to the present, have been purely hypothetical. No one has attempted a detailed series of investigations connected with the expectoration and other excretions of the human system; the bodies suspended in the night air of malarious levels and inhaled, and the tracing of such abnormal bodies to their true source; and finally the developing of ague paroxysms with these bodies. With these few remarks, we will proceed to a brief description of our researches regarding the origin and cause of intermittent fever.

During a lengthy series of careful experiments, connected with camp diseases, and those affecting vegetation, as the "curl in peach leaves," and the "blight in apple, pear, and quince trees," &c., and in studying the causes and consequences of fermentation, gangrene, decay, and the changes going on in diseased tissues; I was led by some of the experiments connected with bodies suspended in the atmosphere, to inquire into the causes of fevers, and especially those of an intermittent type.

Intermittent fever began to show itself in the rich malarial districts of the Ohio and Mississippi valleys, in 1862, during the month of May. It did not, however, prevail to any great extent till the months of July and August. The weather had been unusually damp up to about the first of July. During the months of July, August, and September there was scarcely any rain. Springs and streams became very low, swamps and humid grounds became dry, vegetation almost entirely ceased to grow, and the country presented all the signs of a severe drought. Soon after the dry weather commenced, intermittent fever, in malarial districts, became quite general. The disease rapidly increased during the months of July and August, till it had invaded nearly every family on ague levels.

The observations were commenced by examining microscopically the expectoration of those labouring under intermittent fever, and who resided upon ague levels and were exposed during the evening, night, and morning to the cool, heavy, damp exhalations and vapours rising from stagnant pools, swamps, and humid low grounds; in short, those who were constantly immersed in a malarial atmosphere, and where every one was more or less affected with symptoms of miasmatic poisoning.

The first salivary secretions and mucous expectoration of the morning, were those used. In these secretions occurred a great variety of zoosporoid cells, animalcular bodies, diatoms, dismidiæ, algoid cells and filaments, and fungoid spores. The only constant bodies, however, uniformly found in all cases, and usually in great abundance, were minute oblong cells, either single or aggregated, consisting of a distinct nucleus, surrounded by a smooth cell-wall, with a highly clear, apparently empty space between the outside cell-wall and nucleus. Their peculiar appearance satisfied me early in the examination that they were not fungoid, but cells of an algoid type, resembling strongly those of the palmellæ. This part of the inquiry was extended to a great number of individual cases, on the low malarial levels, and to persons residing on elevated lands near and far removed from malarial influence. Whenever the mucous secretions were examined, from persons residing above the summit plane of ague, these bodies were invariably absent. They were found only below the summit ague line; whereas, diatoms, dismidiæ, fungoid spores, and animalcular bodies, extended to some extent to all heights above the ague line; especially were they found in the vicinity of damp high grounds and streams.

After satisfying myself that these minute cells were the only forms found that could be relied upon as constantly present, on malarial levels and not present above them, my next step was, if possible, to trace their source and character.

In order to effect this, I commenced suspending rectangular plates of glass, sixteen by twenty-two inches, about one foot above the surface of stagnant pools and marshy grounds that were partially submerged. The plates were placed horizontal, each resting on four pegs, a single peg supporting each corner of a plate. The plates were placed in position at dusk, and secured in the morning before sunrise. Invariably the under surface of plates would be covered thickly with large drops of water. This condensed vapour was subjected to careful microscopic examination. Many of the cells were found that occurred in the expectoration; but none of those minute oblong cells, so uniformly present in the morning expectoration, were met with. On the upper surface of the plates, however, these bodies were found in considerable numbers. I repeated these experiments for many nights, varying widely the localities, with the same results.

In passing to the stagnant pools and swampy grounds southeast of the city of Lancaster, Ohio, to suspend the glass plates, I had to pass over a rich, peaty prairie bog, where the water had become mostly dried off, and the surface broken by the tread of cattle. I had noticed that in walking over this ground, a peculiar dry feverish sensation was always produced in the throat and fauces, often extending to the pulmonary mucous surfaces, and that my expectoration was, after returning, uniformly filled with the minute oblong cells above described. This drew my attention to the partially desiccated peaty prairie bog, where the surface had been recently broken by the tread of cattle. I discovered on the recently exposed earth, what appeared to be a whitish mould, or more closely the incrustation of some salt. I here suspended the plates of glass, and the following morning, much to my delight, found the inferior surface of the plates covered with the minute cells, which I was in pursuit of. I immediately returned to the bog and secured samples of fresh earth, which were covered with the incrustation, and some which were not, and also portions of the boggy turf. On placing a fragment of the incrustation under the microscope, it was at once discovered to be made up of aggregated masses of the minute cells so uniformly met with in the expectoration of those exposed to the influence of the heavy cool vapours of malarial levels. It was further seen that these cells were algoid, and emanated from plants of a palmelloid type, as we had previously suspected. That there were several species, and that in the larger ones, grew several species of mucidinous fungi.

The locality where these first results were obtained is situated on the southeast side of the city of Lancaster, between the canal and railroad, and just east of the depot and starch factory. Here stretches out to the southeast, along the canal, a low peaty, prairie bog, and in its vicinity the surrounding bottoms are low and humid. The portion of the town (3d ward) adjoining this bog, or all of it situated below a line about thirty-five to forty feet above the bog, has always been a fertile field for intermittents. Those living immediately on the edge of the bog are frequently subjects of ague, yearly, from May till November. August and September are usually the worst months.

To determine how high above the low grounds the bodies found on the under surface of the suspended glass plates were elevated, both at night and day, a small apparatus was used, which consisted of a glass screen standing perpendicular, and in front of it a large funnel, with the broad open end pointing from the screen, and the small end terminating within one-half inch of it. This was arranged on a pivot, and so constructed that the force of the currents of air kept the broad mouth of the funnel towards the wind. When an observation was to be made, the screen was covered with a concentrated solution of chloride of calcium, and the apparatus suspended at the desired height and left for one hour. The wind passing through the funnel, and falling upon the coating of calcium, deposits its small suspended particles upon the smeared screen. On examining under the microscope the liquid on the screen, after an hour's suspension, all the bodies floating in the atmosphere are found. By suspending this apparatus at different heights above the low ague levels, at all hours of the day and night, the following facts have been ascertained :—

1. That cryptogamic spores and other minute bodies are mainly elevated above the surface during the night. That they rise and are suspended in the cold, damp exhalations from the soil, after the sun has set, and that they fall again to the earth soon after the sun rises.

2. That in the latitude of Ohio, these bodies seldom rise above from thirty-five to sixty feet above the low levels. That in the northern and

central portions of the State, they rise from thirty-five to forty-five feet, while in the southern, from forty to sixty feet.

3. That at Nashville and Memphis, they rise from sixty to one hundred feet and more above the surface.

4. That above the summit plane of the cool night exhalations, these bodies do not rise, and intermittents do not extend.

5. That the day air of malarial districts is quite free from these palmelloid spores, and from causes that produce intermittents.

With the view of tracing more carefully the symptoms of the local fever, produced in the mouth, fauces, throat, and lungs, by inhaling the cells and sporoid bodies emanating from the vegetable organisms forming the incrustations on the drying, rich, freshly exposed soil of malarial grounds, I visited, Sept. 2d, 1862, the bog above referred to and spent some time in wandering over its surface, examining the incrustation, and in collecting samples for further microscopic study. In a very few minutes after my arrival on the bog, I began to feel a dry, feverish, constricted feeling in the mouth, fauces, and throat. This feeling increased till the fauces and throat became very unpleasantly parched and feverish. The opposite walls in swallowing adhered together, and the normal mucous secretions were quite entirely checked. There was a constant desire to swallow and hawk and spit, without being able to raise much, or to relieve in the least the dry, feverish, constricted sensation. This feeling soon extended to the bronchial and pulmonary surfaces, which became dry, feverish, and constricted, with a heavy congested sensation and dull pain. These peculiar symptoms lasted about two hours after leaving the bog before they entirely disappeared. The malarial matters inhaled appeared to be poisonous to the surfaces with which they came in contact; and there seemed to be an effort on the part of the exposed mucous surfaces to close up their absorbent and secretory organs, until this poisonous matter could be dislodged by the swallowing, and hawking, and spitting which they excited.

On the morning of the 3d of September I again visited the bog, to obtain more specimens for examination, and to study still further the symptoms produced by inhaling the malarious matters of ague bogs. I remained walking over the surface for about half an hour. The same train of symptoms manifested themselves that I experienced on the previous visit, being quite as severe and lasting quite as long.

On the evening of the third, just at dusk, I again visited the bog to suspend glass plates. I remained about fifteen minutes. I had scarcely left the ground when the dry, constricted, feverish feeling of fauces and throat commenced; and I experienced the same train of symptoms as on the previous occasion. Between this and the last of October I daily visited this and other similar bogs, always with the same result.

On Sept. 18th, Dr. Effinger, at my request, accompanied me over the bog, with the view of determining whether he would be affected with the same train of symptoms as myself. In a very few minutes after our arrival the symptoms began in his case, as in my own, and he described them precisely as they have been already stated.

On Sept. 20th Dr. Boerstler walked over the bog with me and experienced the same symptoms. Dr. B. remarked that he had often experienced the same, or similar sensations before, without knowing the cause.

Numerous other persons, who visited with me ague grounds, were invariably affected with the same train of symptoms.

The only constant foreign bodies found in the expectoration of those affected with the above local symptoms produced by walking over ague grounds, and in the expectoration of those immersed in the night emanations of malarial levels, were the minute palmelloid cells previously described. The source of these cells was found to be the palmelloid plants growing in such profusion on the drying soil of ague lands during the prevalence of intermittents. It is hence inferred that the minute cell emanations from these low vegetable organisms are capable of exciting local fever in the mucous surfaces with which they come in immediate contact; and further, that there is strong presumptive evidence from what has been previously determined, that by repeated and continued exposure to them they may cause general fever of either an intermittent or remittent type. This will appear more conclusive after perusing carefully the observations and experiments which follow.

On the northwest side of Lancaster, in the vicinity of the old canal mill, is another district of considerable extent, where the people are universally subject to ague. With the view of exploring for the local cause, I visited the locality Sept. 12th. Immediately west of this infected district is a wide low rich prairie. A few rods south of the mill and also west of it, I found the ague palmellæ growing luxuriantly, covering the surface of the soil recently thrown up by moles and exposed freshly by the tread of cattle. In fact, over the entire prairie, wherever the soil had been recently exposed the plants were developing in profusion. While collecting samples for microscopic examination, I became affected with all the peculiar symptoms of local fever previously described.

On the north edge of Lancaster, immediately on the west and south sides of Mount Pleasant, is another locality where ague prevails in its worst form; often running into fever of a remitting and continued type. There is a low belt of ground running through this locality, along which are stagnant pools of water. Around these pools and in the rich humid broken soil of the vicinity, I found the ague palmellæ growing in profusion. While collecting specimens for examination, I experienced all the symptoms of local fever as previously mentioned.

On the Columbus road, about one mile northwest of Lancaster, on the farm adjoining on the north the old Tallmadge place, occurred suddenly, about the middle of September, a severe case of ague in a strong healthy young man. This locality had been previously exempt from the disease. I visited the point with Dr. Effinger, who was attending this patient. About fifteen rods south of the house, we discovered a new ditch about ten rods long, running through a piece of low, black, humid ground. The freshly thrown out earth and the sides of the ditch were covered with ague palmellæ. While examining the soil along the ditch and collecting specimens for the microscope, the mouth, throat, and pulmonary surfaces became dry and congested as in previous instances.

This ditch was dug by the young man about two weeks previous to his attack.

On Sept. 21st, in company with Dr. Effinger, I visited Mr. C. and family who reside five miles northwest of Lancaster, in a locality previously exempt from ague. Mr. C. was attacked with a severe form of the tertian type of intermittent fever on Sept. 1st, and his wife on Sept. 3d. The paroxysms were arrested on the fourth day of the disease with quinia, by Dr. E., their attending physician. Relapse on the 15th; was arrested after the second paroxysm. Both Mr. C. and wife, on Sept. 21st, were much debilitated, pale and sallow. Mr. C.'s house stands upon the edge of a low terrace, elevated about 30 feet above the prairie bottom, which approaches within fifteen rods of it, on the south and southwest sides. About fifty poles southwest of the house, a small creek, running through the prairie bottoms, empties into the canal. This creek, during rains, washes in sediment and makes a troublesome bar across the canal. The *lessees* of the canal had purchased, a short time previous, of Mr. C. an acre of ground at the mouth of this creek for the purpose of excavating there a reservoir to receive the sediment of the creek. About the middle of August, the workmen began the excavation. The soil excavated was a rich, peaty loam, with some black and blue clay. Very soon after the excavating was commenced, the workmen began to be taken down with ague, and very soon nearly every man was labouring under the disease. On Sept. 1st Mr. C. was attacked; on the third Mrs. C. was taken down with the same type. On Sept. 21st Dr. Effinger and myself visited the excavation, and found the excavated soil covered with "ague plants," a quantity of which were collected for examination. While gathering them, both Dr. E. and myself were affected with the symptoms of local fever as previously described. Mr. C., who accompanied us to the excavation, became so much affected in the throat, fauces, and lungs, that he had to retire from the place. Mr. C. stated that he and his wife slept in a room in the southeast corner of the house, on the lower floor; while the children, seven in number, ranging in age from two to fourteen, slept on the second floor, immediately over theirs. He and his wife were attacked with ague on the first and third of September, while all his children were entirely exempt and perfectly well. He also stated that early every morning he noticed that the "fog" from the reservoir grounds extended to the house, and rose about two-thirds the way up the first story, and entered freely his sleeping apartment through the open window, and had the same odour as the soil containing the ague plants, and produced the same febrile symptoms in the throat and fauces. He never had noticed this fog to rise as high as the second story window where his children slept. The foggy vapour dissipated soon after sunrise and before his children were up. He stated that he had lived there over forty years, and had never had the ague before. That all his neighbours around, on the same and lower levels, were now suffering from the disease. I mention this case particularly, as it is of peculiar interest, showing in a striking manner a quite fixed and marked line indicating the summit plane of invasion, above which the malarious causes do not extend.

In the eastern half of the city of Lancaster stands a hill, having an area of about one hundred acres. Upon its sides and summit the finest portion of the town is built. This hill rises to the height of about sixty feet above the adjacent low prairie bottoms, on its south and southeast sides. The heavy, cold, night vapours, emanating from these bogs, rise within fifteen feet of its summit. The upper surface of these vapours, in the morning before sunrise, is seen, from the surrounding hills, to be a broad, level plain, limited by its contact with the adjacent hills. The line described around this hill, by the upper surface of these vapours, is a horizontal one, and marks distinctly the ague line. All of those living on the hill above this line are exempt; all below are subject to the disease. The line is so well defined that, of people living on different floors of the same house, those on the upper floor are exempt, while those on the floor below are frequently all down with the disease. If any cases occur above the summit ague plane, they are found to be in such persons as frequent the lower levels during the evening or early morning.

During the summer of 1862, and especially during the months of August and September, intermittent fever prevailed to a remarkable extent in the town of Carroll, situated on the canal, between Lancaster and Columbus. The site of the town and much of the surrounding country is low, and many boggy places occur along the canal. During the months of August and September, the old and young of almost every family, including physicians, were down with ague. I visited this locality several times during these months, and found the ague palmellæ growing abundantly on the partially desiccated, boggy soil, along the canal, through the town and vicinity, and found the morning expectoration of all more or less filled with the minute cells of these plants.

Numerous other localities were visited where intermittent fever prevailed, and in every instance, without a solitary exception, the ague plants were found growing in the immediate vicinity of the disease, and in no instance were they found when the disease did not occur.

An interesting instance of the readiness with which the emanations from these ague palmellæ produce the disease, presented itself, the last of September, one mile west of the city of Lancaster. At this point, a few poles south of the pike, and about fifty poles west of Judge Van Tromp's residence, is a small pond, that affords water to a small flouring mill. During the months of August and September, the water became low in this pond, and the ague palmellæ made their appearance in abundance on the drying, peaty mud, from which the water had retired. From the time these plants appeared, till the last of September, the wind was in the south. There being no buildings on the north side of the pond, there was no appearance of the disease. Near the last of the month the weather became cool, the wind changed and blew briskly from the north and northwest. About thirty poles a little southeast of the pond, twenty-five to thirty feet above it, on the hillside, a strong, healthy, labouring family resided, who had been, up to this time, entirely free from ague. The wind blew over the pond directly towards this house. About the fourth day, several members of the family were taken down with the disease. The wind now suddenly changed to the southeast, blowing across the pond, directly towards the tollgate, about forty poles distant, where a family resided in which were four small children. This family had been, up to this time, also exempt from the disease. The third or fourth day, two cases of intermittent fever occurred among the children, and soon after the father was attacked.

Here is an interesting instance of the transmission of the malarial influence by the winds. These families had lived for nearly two months in the vicinity of an abundant crop of ague palmellæ, without taking the disease. The pond being small, banks abrupt, and soil around dry, no fogs or night vapours, to any extent, emanated from the place to diffuse the poison. What malarial matters there were emanating from this point, were borne north by the prevailing wind. As soon, however, as the wind changed, and blew over the pond towards the neighbouring abodes, the disease, in a few days, appeared.

A very interesting instance of the sudden occurrence of intermittent fever, at a point where it was never known before, occurred at the residence of Hon. John T. Brasee, one and a half miles west of the city of Lancaster, upon an elevated ground, about one hundred feet above the ague levels, and far removed from them. The locality has always been, from the first settlement of the country (sixty-five years), exempt from intermittent fever. The farm is abundantly supplied with fine large springs of pure freestone water, cold and soft. Near Mr. B.'s residence, one of these springs occurs. It had formerly supplied a small fishpond, containing about ten square rods of surface. This pond, several years ago, had been drained, and the rich alluvial bed had become covered thickly with grass. About five square rods of it were spaded up, for the first time, in the month of July, 1863, for celery and vines. Ague palmellæ began to appear on the freshly-spaded soil about August 1st. A portion of these were white, like those usually met with, while others were of a brick-red colour, giving to the surface the appearance of having been sprinkled over with a thin layer of brickdust. Aug. 8th, Mr. Brasee and wife, who slept on the lower floor, began to feel languid, with loss of appetite, and pains in limbs and back. 20th, Mr. B. had his first chill, which came on about 12 o'clock (noon). The paroxysm lasted about three hours, and was very severe. 22d, Mrs. B. had her first paroxysm, which continued for about three hours, and was also very severe. 23d, the farm-hand and his wife were attacked. Mr. B.'s residence stands about ten rods north of this patch of ague ground, and his tenant's house about fifteen rods south of it.

August 22d, I examined the patch minutely. It was perfectly covered with ague palmellæ. Those growing on the dry prominences of the soil were white; those on the retired, smooth, and more damp portions, were the colour of brickdust. The whole surface had the appearance of having been sprinkled over with brickdust and lime. No cases of ague occurred in that portion of the family who slept up in the second story, nor were there any premonitory symptoms of that disease.

August 24th, the small ague patch was covered, at my suggestion, with a layer of straw, to the depth of six inches. On suspending glass plates over this for several nights, I obtained no trace of the palmelloid spores or plants, while before the straw was spread over the plants, the glass plates were covered nightly with them.

The four cases of ague readily yielded to treatment, with no subsequent manifestations of the disease. The straw, in this instance, prevented the further development of the ague palmellæ, and prevented the spores of the already mature vegetation from rising in the damp night vapours.

Another interesting instance came under my observation in the city of Columbus, Ohio. On a visit to this place, during the last of September, 1863, I met Mr. Theodore Tallmadge, who stated to me that his children were all being attacked with ague. He stated that his family had been spending a few weeks at White Sulphur Springs, and that about two weeks before, they had all returned home hearty and well. In a few days after their return, one of his children was attacked with ague, and soon after, another. This surprised him, as ague had not previously been known to occur at his residence. Feeling satisfied that there must be some local cause, I, on the following morning, repaired to his house and examined his grounds. I immediately discovered a prolific crop of ague palmellæ directly in the rear of his kitchen, in some new, peaty soil he had drawn there, a few weeks previously, to level off the surface. I directed him to sprinkle the surface of the new soil thickly over with caustic lime, after which he had no more cases of the disease in his family.

On the rich limestone lands of the Maumee and Miami Bottoms, in Ohio, the black, alluvial lands of the Wabash and its tributaries in Illinois and Indiana, the fertile prairie lands of these States, and Missouri and Iowa, and on the rich, low, limestone, and alluvial lands of Kentucky, Tennessee, and Mississippi, ague palmellæ develop in great profusion, especially during the months of July, August, and September. For the most part, wherever the soil is free from lime, and the water soft, the ague palmellæ developed are mostly white, or slightly tinged with yellow and green, and intermittents are comparatively free from congestive tendencies, and the types better marked, the eliminating organs much less liable to become badly deranged, and the paroxysms more readily yield to the tonic influence of quinia and iron, and the disease is quite promptly and easily controlled, unless the system be exposed to the continued and constant action of the cause of the affection. In limestone regions, however, where the water is hard and the soil highly calcareous, there is a remarkable tendency, during the months of July, August, and September, for the malarious portions of the soil to become covered with palmellæ, mostly of a different colour from those found on soil not calcareous. On calcareous soil the palmellæ are usually pink, brick-red, greenish, or yellowish. The brick-red and greenish plants are the most abundant. In such localities, intermittents are apt to assume a congestive type, the functions of the eliminating organs (epidermic and mucous surfaces, and portal and renal glands) become much deranged and partially suppressed, oxaluric, and often phosphoric states follow, and, in this condition of the system, quinia, iron, and arsenic, alone or combined, do but little good, and often in old and bad cases, tend to aggravate the disease. If, however, in these severe forms, the functions of the eliminating organs be restored to their normal or to increased activity, by the proper diuretics, diaphoretics, expectorants, and alteratives, the paroxysms readily yield to the tonic and anti-zymotic influence of quinia and iron.

College Hill, Nashville, Tennessee, rises from 75 to 100 feet above the level of the Cumberland, which flows around its northern and eastern base. Upon its summit is an area of from six to ten acres. Here stands the University of Tennessee, and the residences of several of the faculty. When the Federal forces drove the Confederates from Nashville all of the high points or eminences, in and around the city, were fortified, for the better defence of the place. This hill was strengthened by a ditch six feet wide and four feet deep, with the excavated earth thrown on the outside, and running around on the eastern and southern brows which face the adjacent country. Soon after the University buildings were appropriated for hospital purposes. This high point was supposed to be peculiarly healthy from its elevated airy position, overlooking most of the city and surrounding country. As soon, however, as the warm weather of May and June set in it was found that this high ground was quite malarious, giving rise to a peculiar type of congestive intermittent that was very severe, producing in some instances death. The attendants were more subject to the disease than the inmates of the wards. This, probably, arose from the fact that the former often exposed themselves to the evening vapours and exhalations outside, while the latter were mostly confined to the wards.

This peculiar type of intermittent became much more severe during the months of July, August, and September. The surgeon in charge, Dr. Lynde, was under the impression that this malarial influence came from the low ground to the east of the hill which bordered on the river, and which was half a mile distant and 100 feet below. This, on careful inquiry, was found to be highly improbable, as the malarial influence was much less marked on this low ground than on College Hill. On carefully examining the soil on the perpendicular sides of the ditch, which was dug to strengthen the place, it was found covered completely with cryptogamic vegetation, forming, in places, a greenish, and in others a brick-red film on the surface. Samples of this soil were preserved in boxes for microscopic examination. On my arrival at Cincinnati, three days after, this vegetation was carefully examined under the microscope, and found to be composed of green confervoid filaments and palmellæ, having mostly a pale green and a brick-red colour. The vegetation was very prolific and abundant. The palmellæ were of different species from those met with on non-calcareous soils, and were similar to those in districts where intermittents are of a congestive type.

Occasionally the soil on the hill, where it had not been disturbed, was covered slightly with this same vegetation. This was noticed all through the city and surrounding country wherever there were any indications of a malarious tendency. It was not, however, noticed in any great abundance, except where the fresh soil had been thrown up to a depth below where it had been usually disturbed in cultivation.

The city of Nashville stands on a series of small conical limestone eminences, which rise from 50 to 100 feet above the river. The limestone comes to the surface, or nearly so. This is so much the case that the rock is perfectly bare, and denuded of soil, over at least one-fourth of the surface, while the balance has a covering ranging from two inches to four feet in thickness. Wherever a cellar is dug it is sunk into the solid rock. The same may be said of all sub-drains and sewers. The limestone is usually either porous, shaly, or massive, and is rich in fossil remains.

The soil on College Hill is rather deeper than on most of the surrounding eminences, and the summit has a larger and more level area. The digging of this defensive ditch changed the health of the locality, so that now, instead of being the healthiest locality in and around Nashville, it has become decidedly the most malarious and sickly.

On the limestone soil surrounding *Louisville, Ky.*, and in *Jeffersonville*, opposite, similar species of palmellæ are developed upon the soil to those found at Nashville. All the low limestone lands in this region appear to be more or less malarious. Those just above Jeffersonville, where is erected the U. S. G. Hospital, on the Chestnut Hill plan, are very malarious. This site is on a low terrace, about 70 rods back from the river, and rising about 20 feet above the river bottom. Immediately upon the brow of this terrace is located the hospital. The grounds had several sink holes, filled with stagnant water, which now have been filled up. Around the base of the terrace, springs, for nearly a mile in length, make out, forming a boggy, swampy strip of ground, from 10 to 20 rods wide. The south wind blows over this directly up to the hospital. It is made up of a black sandy muck, underlaid with stiff clay. This soil produces, during the months of July, August, and September, abundant crops of ague palmellæ. On this account the hospital is unfortunately located.

The low grounds around *Cincinnati and Covington*, during the months of July, August, and September, produce the ague palmellæ to some extent, and are malarious. Intermittent fever, often severe, is here met with.

Camp Dennison.—At this point is located the *Dennison* U. S. G. Hospital. It is about 16 miles from Cincinnati, on the Little Miami Bottoms, and about 25 feet above the river bed. The soil is calcareous, being underlaid with limestone. The hospital inclosure contains 180 acres of bottom land. Through it passes a shallow ravine, a drainage line from the adjacent hills to the river. The northern fifth of the grounds, previous to draining them in the spring of 1863, with open ditches, was damp, the surface water standing till evaporated, the natural surface drainage being very poor. The wards standing on this soil were found to be unhealthy, the inmates being very subject to intermittent fever. Since it was drained the wards have been empty. The soil over this portion of the grounds, wherever it is exposed by eve drains, ditches, &c., becomes, during the months of July, August, September, and October, covered with a green, cryptogamic vegetation, which, in places, becomes of an ink-black colour. This vegetation is composed mostly of confervoid filaments, which are frequently terminated when mature by sporangia. These sporangia are noticed when the vegetation has assumed an ink-black colour, with a metallic lustre. Mixed with these filaments are numerous palmelloid plants of two species, one green and the other brick-red. When mature these plants, as they become dry, send off multitudes of minute spores, which are elevated in the night exhalations.

There is also met with on calcareous soils another species, of a metallic lead colour by reflected light. By transmitted light they have a dirty, brownish-green colour.[1]

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[1] It may be here remarked that *Palmellæ* belong to the lowest known vegetable organisms. The several forms of this type which are constantly attendant on intermittent malarial disease have received the generic name *Gemiasma* (earth miasm).

Gemiasma (Salisbury). Plants having the appearance of cells, each consisting of a thin outside wall, inclosing an inside cell filled with minute spores, either single or aggregated, multiply by duplicative, segmentative within a parent mem-

So far as I have examined (and my observations have been widely extended), I never have found a case of ague, *in situ*, where I did not find

brane, and also developed from spores. Colours various, as red, green, yellow, white, plumbeous, &c.

There are several species which seem to act as malarial poisons. The brick-red, green, and plumbeous plants are principally found upon rich calcareous soils; while the greenish-yellow and white varieties are found mostly upon non-calcareous ground.

G. rubrum (Salisbury). Colour, brick-red. Gives the soil the appearance of having been sprinkled over with brickdust. Produces intermittents of a congestive type.

G. verdans (Salisbury). Colour, green.

G. paludis (Salisbury). Colour, greenish-yellow. Found mostly on non-calcareous soils.

G. plumbous (Salisbury). Colour, plumbous by reflected, and a dirty brownish-green by transmitted light.

G. alba (Salisbury). Colour, greenish or yellowish-white.

In all these species the mass of the visible dust, or incrustation upon the soil, is usually made up of incalculable multitudes of minute spores that have escaped from the plants beneath them. These most minute of all known organic cells are the organisms that are elevated in the night earth exhalations.

Another type consists of jelly-like protuberances, single or in groups, made up of a thin external membrane inclosing a highly transparent, gelatinous material filled with minute double walled spores. This type has received the generic name *Protuberans*.

Protuberans (Salisbury). (Ag. gave this name to a species.)

In these the double walled spores are developed in a highly transparent jelly-like frond, surrounded by a delicate membrane. These are various shades of green, yellow, brown, and, perhaps, other colours.

Another type of plants seem to multiply by the extending laterally of a thin lamina or gelatinous layer, which, like the protuberant variety, consists of an outside parent membrane, within which is a gelatinous matter, filled with a multitude of minute double walled spores, which escape in vast numbers as the lamina dries. This type has received the generic name *Lamella* (Salisbury).

All these genera have spores of a similar structure. The spores are mostly oval, or more or less oblong, and have double walls. The spores of the Protuberans are larger than those of the other genera, and the space between the nucleus and outside cell-wall is more marked.

In the Palmellæ there are two modes of propagation, one by division and the other by spores, and both of these are often common in the same species. These plants are very prolific, springing into existence in a few days in vast multitudes, during the hot summer months, on the drying beds of ponds, stagnant pools and ditches, on the broken soil of humid low grounds, and new prairie lands in malarious districts.

The species are many, all of which have heretofore been regarded as innocuous. There is strong evidence for believing, however, that the minute species that are developed in such abundance in the above-named localities, and the spores of which become elevated and suspended in such multitudes, in the heavy humid night exhalations of ague districts, are decidedly poisonous to the epithelial surfaces with which they come in contact, and are the true source of intermittent and remittent fevers.

these plants growing near; and *vice versa*, I never have found these plants growing in any locality but that (if such locality was inhabited) intermittent or remittent fever, or both, prevailed in proportion to their extent and profusion.

As early as the dry warm weather of spring and summer evaporates the surface water, and begins to dry off the recently exposed soil of rich humid low grounds and peaty bogs in certain localities; a peculiar white, green, or yellowish, or greenish-white, or brickdust powder, will be noticed making its appearance upon the surface. This is thicker in such places as have been recently broken, exposing fresh earth. It also varies considerably in appearance, according to age, rapidity of surface drying, and peculiarity of soil. It is not confined to desiccating peaty bogs and humid low grounds, but is common to the drying beds of streams, pools, ponds, and ditches, and also to calcareous soils, and even sandy plains in humid localities.

On the drying of the newly exposed soil of rich prairie lands and humid low grounds, this vegetation appears white and much thinner than on desiccating peaty bogs. This difference arises from the development on the latter of some larger species than grow upon the former, while the small species of the former are common to the latter. These plants occupy the projecting points and prominences of the soil, and resemble to the unaided eye, an incrustation of saline matter. During the drying of the soil, these plants develop rapidly, and as rapidly disintegrate and set at liberty their spores, which become elevated and suspended in the damp, heavy night exhalations. These exhalations, suspending their palmelloid cells and spores, rise, usually, so that their upper surface in the Northern and Western States, is marked by a plane varying from thirty-five to sixty feet above the surface of the ague grounds. The upper surface of these exhalations describes a horizontal plane, stretching away from the place of origin, in the direction traced by the wind. The spores and cells of these palmellæ are found diffused throughout these vapours, but do not extend above them. They occur, however, more abundantly at and near their upper surface, than lower down. This will explain the singular fact often noticed, that at a certain distance above the ague bottom, along the side hill, malarious diseases are frequently worse than on the bottoms themselves. The zone occupied by these exhalations has a temperature and hygrometric condition of its own; differing materially from the stratum of atmosphere resting immediately upon it, which is much warmer and dryer.

Plants in the Urine of Ague, which act as an Exciting Cause.—The urine of several hundred cases of intermittent and remittent fever has been subjected to careful microscopic examination, with the view of arriving at general results, as to the abnormal bodies present. The urine was in some cases voided before treatment had commenced; in others, after treatment had been continued for some days, without breaking the paroxysms; and in others the paroxysms had been broken for the time with quinia, while the fever poison still remained in the system. The urine was voided, either in the algid, febrile, or sweating stage of the disease; between the paroxysms, or after the paroxysms had ceased for some days. The results of these examinations are highly interesting. They establish the fact that ague plants, the same as grown upon the ague soil, are constantly developing in the system of the intermittent fever patient; and that the urinary organs constitute one important outlet for the elimination of this fever vegetation. That the urinary organs, with the perspiratory apparatus, are the important channels through which nature strives to rid the organism of the exciting cause, and through which the physician should operate by all the medicinal means at his disposal, to eradicate the disease. They explain to us the important reason, why it is that quinia breaks the continued recurrence of the paroxysms, while it does not eradicate the poison; and why diuretics and diaphoretics and expectorants are such all important aids in eliminating from the system the malarial cryptogams. While quinia braces up the system by its powerful tonic action upon the organizing processes of the epithelial tissue, and through this imparts such tonicity to the nervous system as to enable it to resist the paroxysms, it is well known not to exterminate the exciting cause; although it may control for a time their further development, in the same way that it checks the multiplication of yeast plants in fermentation.

This exciting cause must be carried out of the organism through those excretory channels which nature has provided for the elimination of effete and abnormal products. The principal of these are the perspiratory apparatus, the mucous surfaces and urinary organs. That the perspiratory apparatus performs in this disease an important office, in this eliminating process, we should long ago have understood, from the fact that through this excretory system nature so powerfully acts in her efforts to eliminate the abnormal and poisonous products of the disease. The sweating stage of the paroxysm of ague is essentially a curative one.

These examinations have also established the fact, that in intermittent fever conditions, torula cells are present, indicating the presence of glycogenic matter in the urine. Cholesterine is also uniformly present in this excretion in ague. Both glycogenic matter and cholesterine are found in the liver and spleen. The spleen is the great manufactory of cholesterine,[1] and at the same time organizes some glycogenic matter, as is evident from the development of torula cells in the spleen, when it is removed from the body and allowed to ferment.[2] The liver is the great apparatus for organizing glycogenic matter. The kidneys never normally organize or excrete these bodies. In intermittent fever, we see then, that the functions of the liver and spleen, of secreting glycogenic matter and cholesterine, are in part taken on by the kidneys; indicating, perhaps, something like a metastasis of function; and pointing us to these organs for disturbances that are excited by the cryptogamic poison of ague.

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[1] See my papers on the Minute Structure and Functions of the Liver and Spleen.
[2] Ibid.

There is also found quite uniformly in the urine the spores of a species of fungus—generally vegetating—belonging to the genus *Sphærotheca;* and which is uniformly found growing on and in the larger species of palmellæ, belonging to the genus *Protuberans*, and also in the apple, pear, and quince, producing decay in these fruits. I do not know that this plant produces any abnormal influence upon the system, as it is often met with in the urine of healthy persons.

The ague plants occur in the urine in the form of little cottony flocks, so small that they are scarcely noticeable by the unaided eye, and too few in number to communicate turbidity to the excretion. They vary greatly in amount present in different cases. They are uniformly more abundant when the disease is severe and has continued for some time. They are very light in colour, highly transparent, and appear to be developed in the bladder, pelves of kidneys and ureters, often in considerable numbers. In some cases of ague of long standing, yeast plants, species of *Pennicillium* and *Aspergillus* are also found, developing in large numbers, the mycelia often rising to the surface, a short time after the urine is voided, producing fertile threads and fruit. These plants were found largely developing in the urine of several patients, in the month of September, who had been labouring under the disease most of the summer. In several instances of this kind, I have known the intermittent to merge, after some weeks, into continued fever of a typhoid type. In all cases of this kind, the patients had been receiving constant accessions to the disease, by being exposed daily to the exciting cause.

Plants in the Urine of Intermittent Fever, Consequent on Peculiar Pathological States.—In the urine of all cases of intermittent fever, the spores of Pennicillia are present, indicating the presence of glycogenic matter undergoing fermentative changes. These cells are generally more abundant in obstinate types, and in cases of long standing, than in the milder forms and recent cases.

In several instances, in observations, where the patients had been labouring under severe and obstinate forms of the disease (such as were exposed to constant accessions) for many weeks, tending to typhoid states of the system, the urine was found containing numerous vegetating fungoid filaments, which were the developing Mycelia of Pennicillia, Aspergilli, or Sphærotheci. In these obstinate cases of the disease, the urine passes rapidly to the acetous fermentation even before it is voided, ushering in filamentous development in the cryptogams present. This fermentation progresses so rapidly, that in a few hours after the urine is voided, putrefactive fermentation begins, and small white cottony flocks or tufts of fertile threads appear above the surface. These soon bear spores, when the plants are discovered to belong either to the genus Pennicillium, Aspergillus, or Sphærotheca.

There is a beautiful species of Pennicillium often present, having symmetrical heads, the stem dividing first into four equal pedicels, which ascend close to each other, and soon subdivide each into four pedicelets, each one of which bears a long moniliform line of spherical spores. I do not know that these cryptogams are at all injurious of themselves in the urine; but they indicate the presence of glycogenic matter and rapid fermentative changes, which are abnormal. They are probably merely the consequences and not the cause of the existing pathological states.

Experiments Relative to the Production of Intermittent Fever.—With the view of obtaining still more positive evidence of the intimate relation between the cause of intermittent fever and the cryptogam developing upon drying humid soils, &c., I filled six tin boxes with the surface earth from a decidedly malarious drying prairie bog, which was covered completely with the palmellæ previously described. Cakes of the surface soil were cut out, the size and depth of the boxes, and fitted carefully in, without disturbing more than possible the surface vegetation. The covers were then placed on, and the boxes transported to a high, hilly district, some five miles distant from any malarious locality, and where a case of ague had never been known to occur. The locality was over three hundred feet above the stream levels, was dry, sandy, and rocky. I here placed the boxes of cryptogams on the sill of an open second-story window, opening into the sleeping apartment of two young men; removed the covers and gave particular directions that the boxes should not be disturbed, and the window left open. On suspending a plate of glass over the boxes on the fourth day, during the night, the under surface of the plate, the following morning, was found covered with palmelloid spores, and numerous cells of the same kind adhered to a suspended plate in the room, which was moistened with a concentrated solution of chloride of calcium.

On the twelfth day one of the young men had a well-marked paroxysm of ague, and on the fourteenth the other was taken down with the disease. They both began to feel unnatural and dull about the sixth day. All three stages of the paroxysms were well marked. The type in both cases was tertian, and was readily controlled by the appropriate remedies.

Four members of the family slept on the lower floor of the house, but none of them were affected.

The experiment was repeated at another point, in the same neighbourhood, where one young man and two boys were exposed in the same way as described in the previous case. In this instance, the two boys were taken down with the disease; one on the tenth and the other on the thirteenth day of the exposure; while the young man escaped.

On account of other duties, and the difficulty of obtaining the consent of parties for experiments, I have been unable to conduct this part of the examination further. The experiments thus far, however, are most highly interesting and confirmatory of the previous observations and results of this extended inquiry, on which nearly three years of almost constant labour have been bestowed.[1]

Pathology of Intermittent Fever.—The lesions in intermittent fever are confined mostly to epithelial structures, showing quite conclusively that the exciting cause acts primarily upon the parent epithelial cells; or, those cells that either organize the products that nourish the several tissues, or disorganize those of interstitial decay, so as to prepare them for ready elimination.

These derangements consist in the altering and enlarging of glandular structures, and in inflammations and alterations in structure and function of the mucous, epidermic, and serous surfaces. All other abnormal manifestations are either symptomatic of these, or are the result of previous disease in the organism.

All the glands in the body belong, strictly, to epithelial tissue, and are made up mostly of parent epithelial cells. These structures are affected in time and extent apparently in proportion to their importance in either organizing and assimilating products for nutrition, or disorganizing those for elimination.

Of all the lesions met with in fatal cases, those of the spleen and liver —most important organs of the body—are the most frequent. The spleen increases in bulk and consistence; its structure is easily torn; its interior often being found to be broken down, and composed of a blackish-red pulpy mass, with which are mingled fibrinous portions of a lighter colour.

Morgagni gives one case where the spleen weighed eight pounds; and another is mentioned by Bailly that weighed nearly ten pounds, the structure being entirely converted into a pulp. The spleen has been occasionally ruptured, and the broken-down and altered tissue emptied into the abdominal cavity. This indicates an altered condition in the organizing processes of the parent epithelial cells of the organism, by which the fibrinous matters and other products of the blood formed, become deposited in the splenic tissue, thus producing enlargement (so-called ague cake) which often, if the patient is not removed from constant accessions to the disease, and the exciting cause not eliminated from the organism, results sooner or later in disorganization, and frequently in disintegration of the gland. The liver is also in some cases found greatly enlarged, but altered but little in structure. In others it is softened or filled with black blood, or tuberculated, or containing purulent deposits.

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[1] Another interesting instance of the production of ague paroxysms by this vegetation, occurred since this paper was partially in type. After exhibiting, about the first of November, a large pan of soil, covered with this vegetation, to the class in one of my lectures, I placed it under the working-table in Dr. House's office. It was loosely covered with a newspaper, and forgotten. In a few days the doctor began to have pains in the back and limbs. These symptoms were soon followed by a well-marked paroxysm of ague. As soon as this occurred the pan of plants came to mind and was removed.

The pancreas is also frequently hardened, so as almost to resemble scirrhus. The mucous membrane of the stomach, duodenum, and small intestines are likewise sometimes involved.

The mesenteric glands are frequently enlarged, and are subject to very nearly the same derangements in function and structure as the spleen.

The exciting cause, inhaled, taken into the system in food and drinks, and absorbed by the skin and mucous surfaces, comes in direct contact with the epithelial cells, spread over and covering the entire body, both internally and externally, wherever there are any ways by which external bodies may enter the organism. The epithelial cells, hence, make up the first tissue of the system with which these poisonous bodies come in contact. These cells they have to pass through before they can enter the systematic circulation and reach the vascular tissues. In passing through these cells, they derange them so as to poison the products they organize. In this way the other tissues, including the ganglionic and cerebro-spinal systems, become involved. As the epithelial cells of the glands, especially those of the spleen, mesentery, and liver, are the most largely engaged of any in organizing nutrient products for the other tissues, these glands are the most severely taxed, and are the first to suffer extensively from the poisonous palmellæ, and hence it is that in these we find so frequently grave lesions.

When the tissues have become poisoned to a certain extent, there is a reaction on the part of the system, an effort of nature to eliminate the poisonous products already in the body. This effort is the paroxysm, which constitutes what we call the disease.

We can readily see how it is that the blood of the body should become thin (deficient in fibrin) as soon as the functions of the spleen are partially or wholly suspended. This being the gland which organizes fibrin more largely than any other, if its function in this respect be suspended by the blocking up of the *oval splenic bodies* with partially organized fibrin, one great source of this product would be cut off from the blood. The fibrin already in the blood becomes deposited in the tissues, and one important source being cut off, the blood becomes thin and deficient in this body. This thin blood fills up all portions of the organ not occupied by masses of fibrin, and hence the ease with which the blood contents of the spleen may be washed out. Whenever the whole mass of the blood of the body becomes very abnormally thin, we may look to the spleen for the primary lesion.

Some of the interesting symptoms of intermittent fever, where the spleen is involved, Dr. Tweedie says, are "depression of spirits, torpor of mind, inactivity of body, with much muscular debility, deadly paleness, or a yellowish hue tending more to black or green than in ordinary hepatic disease. There is great liability to hemorrhage from various regions of the body, to dropsy, to dysentery, and to ulcers of the legs. The spleen is liable to take on a morbid condition in continued fevers, as well as in intermittents. Diseases of the heart, stomach, and liver, are liable to be accompanied by diseases of the spleen. The spleen is more liable to be affected with disease in damp, marshy localities than in other situations. In intermittent fevers there is a diminution of red globules and fibrin. Softening and the breaking down of the spleen are common in intermittent and continued fevers, in scurvy, and in some varieties of malignant dysentery."

By understanding the true functions of the spleen, these symptoms and lesions are all traceable to their true cause.

Depression of spirits and torpor of mind may arise from either oxaluric or phosphatic states, or from a defective or suppressed organization of some of the nutrient products of nerve tissue; inactivity of body and muscular debility, from a deficient supply of fibrin to muscular tissue; the yellowish hue, to a defective supply of red globules; the great liability to hemorrhage in different parts of the body, dropsy, and dysentery, to thinness of the blood, and the defective supply to it of its normal products.

The probable reason why the spleen is so liable to take on a morbid condition in continued fevers as well as in intermittents, is that the exciting causes of both affect primarily the epithelial tissue, and have a tendency to derange those portions most which are the most actively engaged in organizing nutrient products, the reason of which appears to be that the exciting causes exist alike in the materials we eat, drink, inhale, and absorb through the skin.

The reason why the spleen is more liable to be affected in damp, marshy localities than in other situations, is, that in the former districts, miasmatic poisons impregnate more or less the air, the water, and the food.

The reason of the diminution of fibrin and red globules in the blood in intermittent fever is the greater or less suppression of the normal functions of the spleen and mesenteric glands.

Treatment.—Since nature in the last stage of the paroxysm excites all the excretory organs of the body, and especially the perspiratory, urinary, and mucous surfaces generally; and as these excretions contain spores and plants of the ague palmellæ, it is evident that the sweating stage is a curative process. If so, it points us to important medicinal means as aids in eradicating the poison. These are diuretics, diaphoretics, expectorants, and alteratives. While we should keep quinia constantly in the front rank to impart tonicity to the ganglionic and cerebro-spinal systems and to the epithelial tissue and to control in the body cryptogamic development, we should use diaphoretics, diuretics, and expectorants freely as eliminators.

The nightly sweating of a patient labouring under this disease, might be supposed to result in enervating the system. The reverse, however, is the case. Under active nightly diuresis and diaphoresis, in ague, the sallow countenance rapidly clears up; the dull eye becomes bright; the depression of spirits and torpor of mind and body disappear, and give place to the elastic step and tonicity of muscle. The result is, that, even when the system is exposed to constant accessions, the paroxysms are not only avoided, but organic lesions, and the long train of unpleasant symptoms are not allowed to get their hold upon the system, the ague poison being eliminated as fast as taken into the organism.

In cases where the patient is removed from the exciting cause, the system is soon thoroughly cleansed, and no ague returns the following spring unless there are new exposures.

The power of the system to resist the paroxysms of ague varies greatly in different individuals, and even in the same individual at different periods. This power of resistance is directly proportioned to the tonicity of the system. Habits of bracing, active exercise, such as horseback riding, will often protect the system against attacks. This is noticed in a marked degree in the cavalry and infantry service of the army. In malarious localities, the former are seldom attacked, if on active duty, with intermittent fever; while the latter are extremely liable to suffer. This is the case when both branches of the service are occupying the same malarious district, and are equally exposed.

Quinia, as a prophylactic, enables the system to resist the paroxysms. It braces up the system, and controls cryptogamic growth till nature can effect a cure by eliminating the malarious cause through the skin, mucous surfaces, and kidneys. Quinia, then, is not, strictly speaking, a curative or specific agent, but simply acts beneficially by controlling cryptogamic development, and imparting such tonicity to the organism as enables it to resist the paroxysms, till aided nature can cure the disease by eliminating the cause. Any cause that enervates the system in malarious regions, tends to bring on the paroxysms earlier than they otherwise would appear. Very frequently it is noticed, especially when the system has been under the influence of the disease for some time, and most especially if the disease is contracted in a region where there is a tendency to congestive paroxysms (limestone regions especially) as in the southern part of Tennessee, in Mississippi, and Louisiana, quinia appears at first to have some influence in enabling the system to resist the paroxysms, but soon loses almost entirely its power. In fact, in many instances, it really aggravates the paroxysms, as is evidenced by stopping the quinia entirely. In such cases the skin will be found dry, the mucous surfaces less active than normal, and covered with a scant, clammy mucous secretion, and the renal excretion small; in fact, all the eliminating organs have their functions deranged and their normal action partially suppressed. As long as these are in this condition, the malarious poison is hemmed up in the organism, so much poisoning the tissues, that the tonic influence of the quinia rather tends to aid, frequently, the abnormal actions than to restore the normal tone. If, however, the normal functions of the kidneys, skin, and mucous surfaces are restored, with diuretics, diaphoretics, and expectorants, and the spleen and liver properly attended to, quinia again will act beneficially and impart its usual tonic effects and the disease will soon be eradicated, especially if the patient be removed from constant accessions.

It is highly important to constantly endeavour to keep the eliminating organs in a healthy and rather increased state of action, when the system is under the influence of any malarious poison, as it is through these channels that the causes are eliminated. We have, then, in this disease, no such thing as a specific in *quinia.* It simply imparts tonicity to the system, and controls cryptogamic development, till Nature, aided by remedial means for exciting the excretions, is able to eliminate the poison.

These principles should be strongly impressed upon the mind of the physician who has charge of malarious diseases. Many old and obstinate cases of ague, with the system filled with the malarious poison, and all the channels of egress closed, are being daily dosed largely with quinia, arsenic, and iron, with little or no effect, with the view of curing the disease in some empirical and mysterious way by these so-called *specifics.* The very name *specific* should be blotted from medical science, and left entirely to the *quack,* who knows nothing else. There is really no such thing in medicine. All we can do in any disease is to aid Nature, and to follow her as closely as possible in her curative processes, and this we can only do wisely and well, by understanding fully the true cause and pathology of every disease we treat.

In treating intermittent fever, it is of the first importance to correct any abnormal condition of the portal system, and to accompany this by diuretic, diaphoretic, and expectorant remedies, to excite into activity all the eliminating organs of the body. It is impossible to mark out a fixed course for all cases. The following prescriptions will, however, illustrate the general plan of treatment :—

℞.—Potass. acetat. ʒij; spts. nitr. dulcis ℥j; syr. scill. comp. ℥ss; aquæ menth. pip. ℥viij.—M. S. Take from one to two tablespoonfuls, in a glass of water, morning, noon, and night. Every evening, on retiring, take a warm diaphoretic draught.

Also, ℞.—Quiniæ sulph. gr. xxxij; strychniæ sulph. gr. $\frac{1}{4}$; mass hydr. gr. vj; pulvis capsici gr. xx; ferri lactat. gr. xx; ext. gentian. syrup. āā q. s.—Make pills xxxii. S. Take two pills every two hours till sixteen are taken. Every day or every other day after, according to the type of the disease, take four pills two hours before the time for the paroxysm. At the end of ten days, take two pills every two hours till sixteen pills are taken, and continue as before for ten days more, then take sixteen more pills. By this time, if the eliminating remedies are kept faithfully up, the patient will be thoroughly cured, if he is not exposed to constant accessions. If he is, the eliminating organs must be constantly kept excited, that the cause may be removed as fast as it enters.

Under this treatment a paroxysm need never occur after the commencement of the remedies.

The means are within our reach for *removing the prolific cause* of intermittents. Rich, humid, low grounds, which produce ague plants abundantly when they are new, undergo some change by culture and drainage, that unfit them for the growth of the palmellæ. As the malarious portions of the country become older, and the low, humid, rich grounds become drained and cultivated, ague districts will become more and more circumscribed, and intermittents proportionally decrease. As long, however, as there remain in such localities, pools, ponds, ditches, and streams, the beds of which are liable to become more or less dry during the warm summer months, intermittents may be expected, to a certain extent, to prevail. These sources of the disease, however, may be much lessened by turning the open ditches into blind ones, draining pools, swamps, and ponds, and subjecting the soil of their beds to repeated cultivation. By this process, intermittents, which now extensively prevail over a large portion of our richest districts, may be so circumscribed in their limits as to be no longer a dreaded accompaniment to the most fertile agricultural sections of our country.

Where it is necessary to make excavations, during the warm, dry months, in new, rich, humid soil, the bottoms and sides of these excavations, with the earth removed, should, at the close of each day's work, be plentifully sprinkled over with caustic lime. If this precaution be well attended to, the ague plants will not develop. It is also highly desirable, in making ditches through malarious soil, to keep the bottom, sides, and thrown-out earth well sprinkled with lime.

As fast as the beds of streams, ditches, pools, and ponds, in ague districts, become dry, they should also be well strewn with caustic lime. This is especially desirable, in this climate, during the months of July, August, and September.

When new prairie land, or new, humid, low ground, is being turned up for the first time, and lime can be readily obtained, it will save much sickness by sowing it over with a good top dressing of caustic lime. If one application is not sufficient to check the growth of ague plants entirely, a second should be made. This application will by no means be lost on the soil, as it serves to neutralize acidity, convert resinous matters into soluble soaps; and the soil is thereby rendered more fertile, and that its increased and better crops will more than pay for the lime application. If lime cannot be obtained, wood-ashes may be used, though their effect will not be as marked or enduring. In selecting camping-grounds for armies, or locations for hospitals, new soil and low prairie, or other humid grounds, should be avoided as much as possible. Wherever open ditches are made, streets excavated, wells and cellars dug, or new earth thrown up or exposed in any way to the drying influence of the sun and atmosphere of May, June, July, August, and September, and especially during the two latter months, if the region is at all malarious, caustic lime should be freely strewn over all such excavations, and over the heaps of soil removed.

Influence upon the System of the Pollen and Volatile Principles of Phænogams when inhaled.—The spores and exhalations of cryptogams are not the only bodies in the atmosphere that excite, when inhaled, abnormal and diseased conditions. During the active flowering of phænogams, the air becomes loaded in their vicinity with the pollen of the flowers, and volatile principles of the plants. These matters are inhaled in large quantity by those breathing the atmosphere containing them. If the plants produce no innocuous or active medicinal principle, the pollen and exhalations, except in particular instances hereafter referred to, have no abnormal influence upon the organism. But if they produce poisonous products, or active medicinal agents, the influence of the pollen and volatile principles inhaled is readily felt.

In passing through or past a field of hops, lettuce, or poppies, in flower, a sensation of drowsiness is soon felt, accompanied often by lassitude and indisposition, either to mental or physical action. In passing through a field of stramonium in bloom, or tobacco, similar sensations follow, with nausea, weakness, a tired sensation about the eyes, followed by pains in the head, &c. In passing among the plants of conium maculatum in flower, drowsiness, with a stiffness of the eyes, followed by swelling of the orbital tissues, and a dull pain in the eyeballs and forehead are the result. These symptoms vary much in severity and duration, according to the time the system is under the influence of the deleterious agents, and the quantity inhaled and absorbed by the surface.

In passing among poison ivy (*Rhus vernix*) when it is in flower, the effects are often so powerful, especially when the air is damp, and during the night, as to produce extensive œdematous swelling and inflammation resembling erysipelas. The pollen of several species of lobelia excite nausea and giddiness. There are many other plants that possess powerful medicinal and poisonous agents, growing in our forests and upon our prairies, the pollen and volatile principles of which, when inhaled, produce marked derangements.

Many exotics of the greenhouse come also under this head. The flowers of all such plants should be avoided as much as possible. Many of those unpleasant sensations experienced by travellers and explorers in a new country, while passing among luxuriant plants and beautiful flowers, arise from the inhalation of the pollen and volatile principles of this vegetation.

No doubt many diseased conditions may have their origin in such exposures.

Dr. Isaac Hays, editor of the *American Journal of the Medical Sciences*, detailed to me, a short time since, some most interesting instances, that had fallen under his observation, of the influence of the pollen of the rose, and also several cases of the influence of the pollen of, and exhalations from, the cereals and other phænogams upon particular persons.

The exhalations from certain plants, when not in flower, produce, on some persons, marked effects. As an instance of this, the poison ivy (*Rhus vernix*) may be mentioned as producing violent symptoms of poisoning, in certain cases, without ever coming in contact with the plant. Such susceptible persons are able to distinguish its presence before they are able to see the plant, by the effect of the air upon them.

Some are highly susceptible to ipecac, it producing peculiar symptoms upon them by simply being in the room with it. Calomel will also frequently excite temporary salivation and nausea in some by simply handling it.

Numerous other instances might be added to those already briefly referred to, to show the effects, upon either some or all systems, of extremely minute portions of certain bodies when inhaled. It indicates to us the probability that the atmosphere may contain many of those subtle causes of disease, which have thus far eluded the search of so many long and patient inquirers.

In conclusion, I may state that this paper presents merely a brief of the investigations in this direction. All the microscopic descriptions, with six plates of illustrations, and many detailed observations and experiments, are omitted, on account of the whole being too long for an article in a medical journal.

ART. III.—*An Inquiry into the Causes of Certain Diseases on Ships of War.* By EDGAR HOLDEN, M. D., late Assistant Surgeon U. S. Navy. Read before the Essex Medical Union, of Newark, N. J., and published by request of the Society.

IT is not designed in this article even to touch upon the interminable discussions regarding the construction, regulation, and climatic liabilities which may, upon ships in general, act as causes of disease, or to discuss, so far as it is possible to avoid it, those common well-known diseases peculiar to men congregated in restricted quarters, but to review briefly and present as concisely as possible, *three* maladies most prominent upon our national vessels and on our own coast during the past four years. Even the scorbutic element must be excluded from the list. Once the scourge of the navy, this latter disease has become less the enemy of the sailor than the soldier, and the unlimited supply of vegetables in a canned, or desiccated state, and prophylactics, of medicinal renown, in various forms have rendered the disease comparatively infrequent.

Indeed, it is a fact worthy of remark, and one reflecting credit upon the profession, that the list of diseases peculiar to shipboard has become exceedingly small, and to-day there is, perhaps, no place where men are associated together where more scrupulous regard is paid to cleanliness and comfort, or better general health prevails than on the vessels of war of the American Navy.

The first and somewhat prominent point to which I would at present allude is the influence of hydro-sulphuric acid.

For a long time this intensely fetid gas, generated in the bilges of ships, was regarded as the chief agent in the production of disease, yet its precise origin and the particular nature of its influence were not generally understood. It was well known that decomposition of vegetable matter together with a moist and long confined atmosphere, were concerned in its generation, but its effects when medicinally administered, *i. e.*, inhaled, or taken in saturated watery solution, were insufficient to explain the phenomena so generally ascribed to it. That we may ascertain its precise influence, and whether, indeed, it is at all instrumental in the production of ship diseases, it may not be out of place to inquire into its general and toxical properties.

The bilge of a ship being the lowest part of the hull, there is always a gradual accumulation of water from the frequent washings of the lower decks and the slight leaks in various parts of the frame. With this water goes down, of course, more or less vegetable and animal matter readily decomposable in the closely confined air. After the ship has lain long at anchor in smooth water or in port, and becomes subject to the motion of the waves, the gas in question is forced up through every crevice, and might now be supposed to produce, if at all, its deleterious effects. On the contrary, however, it meets at its very exit an enemy more subtle than itself in the peroxide of hydrogen, which, under the name of ozone, is supposed to give so bracing a character to the sea-air ; and also in the free chlorine, which to a slight extent exists, and which most rapidly decomposes it. However concentrated the acid may have become, and even when the air seems completely saturated, as it does when the pumps are called in play and the filthy blackened water is allowed to run over the deck to the scuppers, its effect is hardly perceptible.

Occasionally, after the bilge has been long neglected, a prevalence of headache and transient lassitude may be noticed, but seldom to such extent as to require treatment or suggest a single fear of actual disease. Even in the case of sailing ships, where it becomes necessary to use drinking water impregnated with the acid, the effects seem not to be those that we well know are peculiar to the ordinary exhibition of it in solution, as lassitude, nausea, and, in extreme cases, convulsions and loss of sensibilities, but rather those arising from the actual bodily presence of decomposing organized matter, belonging to the stagnant water itself, such as eruptions, diarrhœa, etc.

The gas, as usually encountered on shipboard, is not then responsible in itself for the diseases ascribed to it. Yet I am convinced that there is a way in which it is responsible for certain diseases, and for this reason the subject is introduced into the present article. I refer to its agency in connection with various species of cryptogamæ in production of miasma.

It is with considerable diffidence that I endeavour to present the result of my observations on a subject so hackneyed, so familiar, yet so little understood.

It would be as uninteresting as useless to enter upon the various theories that have, from time to time, been advanced regarding the atmospheric condition or peculiar poison upon which malaria depends, nor is it at all necessary to the present purpose.

That it is essentially organic, and that heat, moisture, and attendant decomposition are instrumental in loading the air with the deleterious particles has become too universally the opinion to require more than passing allusion. Observation of the following accidental phenomena has led me to the belief that in many or most instances on shipboard the poisonous substance in question depends not only on the floating spores of a species of cryptogamia, as is usually believed, but that the particular species is the division known as Thallophyte, that they are inert to a great degree, perhaps entirely of themselves, but that in the presence of sulphuretted hydrogen they will generate miasm and produce disease.

I dare not presume to enter into an elaborate discussion upon so comprehensive a subject, or to present the phenomena referred to as by any means conclusive, since they are far too limited and not followed, as they should have been had circumstances permitted, by closer investigation and more varied experiment. As crude observations merely they are presented, and even as such may not be devoid of interest.

It was the month of March; we had been ten days at sea, and were distant N. E. from the Bermudas about one hundred miles; the crew in good condition; a remarkable degree of health prevailing; and being on an independent cruise for blockade runners, of course all were in excellent spirits.

Before starting out from Norfolk Navy Yard it should be premised the storerooms and holds of the ship had been thoroughly aired and dried, the magazines fore and aft having been under repair.

As soon, however, as the ship began to feel the motion of the waves the fetid gas from the neglected bilge was forced up in quantity, and with persistency almost intolerable. For several days the paintwork of wardroom and steerage showed its influence by an increasing darkness, and this, for some time after we had ceased to consider it even an annoyance. In spite of frequent openings of the hold beneath the wardroom, where our daily provisions were stored, no one appeared to suffer any uneasiness approaching disease. There came occasion to send to the storeroom where were kept my surplus medical stores and liquors. The door of this room opened into the hold. The man, upon presenting the articles for which he was sent, stated that everything was getting mouldy from having the door closed. That afternoon he was seized with a severe chill, eventuating in a fever of intermittent type, the first case on the ship since going into commission. Without noticing any connection between the visit and the disease, one of the wardroom servants was sent down on the following morning. That evening he, too, was attacked. Still not seeing any similarity in the cases, yet wondering to find it under such circumstances, and so far at sea, the matter rested.

One or two visited the same storerooms for some purpose during the ensuing day, but no disease followed.

A few days afterward the paymaster sent his steward to open an adjoining storeroom where was kept new clothing for the crew.

He too spoke of the mould, yet by no means as an unusual occurrence, since it is not uncommon in a closed storeroom so near the bilge. During the following day he was seized with intermittent fever. Now for the first time the similarity in the cases was noticed, and when the paymaster's clerk had been seized under precisely the same circumstances the hold in question was looked to as the point of origin of the miasm. Yet every day one or another visited the adjoining provision room in the same hold, which, however, had never been closed for more than twenty-four consecutive hours, and all continued well.

The next case called attention to the mould as in some way the cause of complaint. It was that of the paymaster himself. He brought a rope somewhat moulded, and handling it awhile replaced it as unfit for use. That afternoon occurred the premonitory chill. These cases, be it observed, were confined to the wardroom, none occurring meanwhile on the berth-deck among the men.

By this time we were arrived at Beaufort, North Carolina. I caused the bilge to be purified and completely washed with sea water.

The idea of a possible connection between the acid and the mould having occurred to me, especial care was taken to keep the storerooms closed till this was done. Afterward the rooms were opened, and though, contrary to advice, several of both officers and men entered them, drawing out boxes and trunks in which to send home mementoes from the vessels we had destroyed, only one other case of the disease occurred.

For several days we lay at Beaufort, long enough at any rate to allow a new generation of gas, and unmindful of past experience, or not viewing the matter in a serious light, under the disappointment of unfortunate orders, no precaution was taken to keep the storerooms properly aired.

The first reminder of neglect occurred upon our arrival at Hampton Roads, when, during the process of pumping out the bilge, I visited the storerooms and found everything covered with light mould as before.

In less than twelve hours, though never before a subject of such disease, even amid unusual exposure, I was seized with chill.

The rooms after this were kept open, and a strong solution of nitrate of lead poured daily into the bilge. (Apropos to this subject might be called to mind the generally received idea that this salt counteracts only the fetid odour of sulphuretted hydrogen without neutralizing its toxical properties, an impression at least not proven).

At this time occurred the only two cases recorded on the journal, among the crew, and one of these seemed singularly enough traceable to a visit to the wardroom hold.

Two months afterward, it being the month of July, and we in James River, above Bermuda Hundred, the same phenomena were repeated; but as the nature of the locality might of itself be supposed a sufficient cause, it would be scarcely necessary to give cases in detail; yet it was before the season for intermittent, and the diseases following exposure were of a more asthenic type, malarious, but tending to remittent and typhoid.

Eight cases occurred in one week. Having at this time supervision of the Medical Department of the James River fleet, I instituted inquiries with regard to all diseases of this nature; but though nothing contradictory could be gathered, nothing of additional interest was obtained.

Cases were isolated and ambiguous, and so unreliable in a locality noted for its miasm, that the inquiry was abandoned. Now whether other circumstances may have conspired to produce the effect, or whether they may throughout have been ascribable to some totally different cause, it is impossible to say; nor yet does it by any means follow that the cause of miasmatic disease always and everywhere depends on the *same* poison. Certain it is, however, the phenomena described struck me with peculiar force.

It may be supposed strange, that no other person should have recorded such a coincidence on board ship, but this ship being known as a double-ender, was of entirely new build and class. It is not often that storerooms are placed in such relation to the hold and bilge, though an everyday occurrence to find their contents covered with mould. It is not often that mould thus formed comes so peculiarly into contact with sulphuretted hydrogen, and it is far less often that cause and effect in disease come so completely under observation.

Here, then, excluding ambiguous cases, were seven occurring under unusual circumstances, commencing at sea.

By the conformation of the ship, the growth of mould was exceedingly common and of rapid growth. Officers and men were repeatedly exposed to its influence while in port, and with impunity, so long as the hydrosulphuric acid lay undisturbed in the bilge. Ordinary continued exposure to the gas itself, even for days, produced no effects; yet exposure to the two combined, was followed by disease. Of course other considerations do enter into the circumstances detailed, such as the long confinement of air, perhaps in itself poisonous, contents of storerooms, the susceptibilities of the men, etc., not possible to discuss at length in this paper. It may, however, be proper to state, in regard to the contents of the storerooms, that they were entirely different from each other; one containing clothing only, the other sealed bottles, and two or three officers' trunks.

Subsequent inquiries, concerning two or three other ships, has corroborated somewhat the idea here advanced, and a careful recollection and reference to experience on others of different class, tend in no way to controvert the phenomena described. I have, therefore, with apology for their incompleteness, and in apparent contradiction of what is probably the latest theory (I mean that so ably upheld by Dr. Ferguson, and approved by Dr. Bennett), ventured to present them as they are.

There are two other diseases, which being perhaps unusual in practice on shore, may be worthy a brief reference.

One an inflammatory disease of the tongue, the other peculiar to ironclads, and termed, for want of a better name, "iron-clad fever."

A third, the "spotted fever" of late discussions, might claim a place from its comparative frequency, but would of itself demand a volume; while its phases thus far observed must be too familiar to bear repetition.

To the affection of the tongue referred to, my attention was called during the first year of the war, on board ship, then lying at the recaptured port of Norfolk, Va. Two or three cases only, however, in that year, were recorded, but during the summer of '64 they were comparatively frequent. The affection was diagnosed and treated as ordinary glossitis, arising probably from some irritating substance in food or drink, but later observation revealed a few unusual, and (because invariable) remarkable deviations from the ordinary course of that disease.

From a list of sixty cases, the following general symptoms were deduced as characteristic :—

A slight febrile movement was the initiatory symptom, with lassitude, headache, and frequently an indefinite sense of impending evil. Several cases were preceded by diarrhœa.

After a period varying from twelve to twenty-four hours, the tongue became coated, swollen, and exceedingly tender, soon the fungiform papillæ became peculiarly distinct and prominent, and in a few hours the circumvallatæ had the appearance of ulcers, covered with a thin, reddish film.

This condition continued, and the other portions of the tongue assumed an eruptive appearance, suggestive of erysipelas. The fever almost always persisted till the third day of the inflammation, when many or all of the circumvallatæ papillæ showed like so many vesicles.

The tongue was now smooth and tense, appetite gone, secretions and excretions of course somewhat deranged—undoubtedly an erysipeloid condition; the peculiarity was the appearance of the papillæ mentioned. No eruption on any other part of the body, or particular inflammation of gums or fauces was observed, at all in consonance with the condition of the tongue. The vesicular enlargement of the posterior papillæ seemed the condition of maturity or crisis. Drying and desquamation followed, yet the scales, thickened and rough as in tuberculous lepra, were adherent for several days after the decline of all other symptoms. That these vesicles were not mere blisters, was inferred from their arrangement in a wedge-like row corresponding to the locality of the papillæ. After repeated observation, the inflammatory affection was decided to be secondary to the enlargement of the papillæ, as though these had absorbed some poisonous material.

Tenderness, pain, difficulty of deglutition, etc., were, as might have been anticipated, often excessive. So invariable was the latter, that even water was refused, and an examination of the mucous follicles with which the base of the tongue is so thickly studded, was rendered impossible.

One other feature of this inflammation was the frequent occurrence of a flaking or peeling off of the mucous membrane of the tongue, leaving a raw muscular surface (apparently), but from which stood the enlarged papillæ, white and glistening like pearls. That this was a simple inflammation was disproved by the symptoms mentioned, and especially by the eruption of the first three days, but that it was dependent on some particular poison directly applied, was beyond doubt, because there existed no invariable affection of either stomach or intestines.

Pickles being a prominent article of diet, the vinegar obtained from them was examined, and, though consisting almost entirely of dilute sulphuric acid, was too common an adulteration in all localities to merit even suspicion. The other articles of food, the ship's coppers, water tanks, etc., were carefully examined, and last and most carefully, the ship's tobacco. Here was found sulphate of copper, sulphate of iron, *arsenic*, and some form of sugar, with a substance impossible to decide upon from lack of proper chemical apparatus. That the poison existed here seemed to be shown by the fact that in every case the patient was addicted to the use of tobacco, but chiefly that the opening of a new box was always the immediate forerunner of an outbreak or increase, yet, on the other hand, not a case occurred among the officers using the same article.

An additional fact was noticed, though perhaps accidental, and that, that the name of the same man does not occur twice on the journal for treatment.

The duration was also noticeable, varying not forty-eight hours from eight days.

As might be expected, few surgeons had regarded the disease as other than mere glossitis of erysipeloid type and epidemic.

Essentially correct, of course, yet as much an error as to confound the fleeting blush of urticaria with the painful glow that follows the application of an epispastic. A few, however, were more observing, and the conclusion arrived at was, "that the affection commenced in the mucous follicles of the base of the tongue; that the condition of papillæ, the eruption and inflammation, were ascribable to the absorption of an uncertain yet constant poison used in the packing of navy tobacco. Concerning the nature of this poison there were none but surmises, the presence of arsenic, the sulphate of iron and of copper being regarded as not positively sufficient to produce the phenomena.

To complete the subject, the leading points of the third and last disease to be considered shall be presented as concisely as possible, viz., "Iron-clad Fever." As a disease it is probably no longer known, the various improvements upon that class of vessels having ended its career; yet to those who sailed in the first monitors afloat it was not only strange but alarming in its progress and fatality. The initiatory symptoms were those of typhus, but before the end of the fourth day, and before the establishment of any marked depressed condition there commenced a severe headache confined to the back of the head, and when this was severe, within a few hours complete aphonia.

So prominent was this that it came to constitute the leading feature of the disease. It came on suddenly, often unheralded, and was usually a fatal prognostic. In my own cases there was no serious difficulty of deglutition, and no very severe dyspnœa, though the testimony of several other surgeons was at variance with this statement in a few instances. From the occurrence of this complication, if complete, the disease made rapid strides. Delirium evinced by eye and expression of every feature, running rapidly into coma, the coma into death.

Remedies, after a few days, seemed worse than useless, nor to any treatment indeed could a favourable issue be clearly traced.

Partial or complete absence of aphonia was of favourable augury, and in the few patients in which this was the case, recovery was hoped for, though invariably slow and tedious.

The pulse and tongue were those of typhus, but there was none of the peculiar eruption. Cerebro-spinal meningitis was suggested, and also spotted fever (considered by many as synonymous terms) but in no case appeared the faintest indication of the eruption of the latter affection. The number that came under my personal observation did not exceed ten, and I was informed by the surgeon of the monitor Patapsco, that all the cases were confined to the first five or six iron-clads that were sent to sea.

Aphonia being deemed somewhat characteristic of the disease, opportunity for autopsy was eagerly looked for. Owing to the demands and changes of war, this did not occur for some time; yet, at last, the bodies of two sailors (I think from the Weehawken) were taken on shore at Port Royal, and examined.

The idea of inflammatory lesion or other affection of the larynx itself, was considered as possible, yet calling to mind the then late discoveries in regard to the action of the communicating branch of the spinal accessory upon the larynx, it was suggested, if no other evident cause of aphonia should appear, carefully to examine that nerve to its origin, as well as, of course, the laryngeal branches of the pneumogastric, the medulla, and cerebellum. The larynx of each case was opened, and found in a congested but not inflamed state. With great care and patience, during a laborious dissection, both laryngeal branches of the pneumogastric and this nerve itself, together with even the communicating branches of the twelfth pair, were examined without result. The cerebrum and cerebellum were also carefully dissected, and in the latter was found the first evidence of disease; there was congestion of the vessels of the pia mater. Proceeding downward, the lateral tracts of the cord, in the vicinity of the olivary bodies, were found slightly softened, and dissecting, as previously designed, down the course of the spinal accessory, and examining more minutely the superior laryngeal, there was found a knotted thickening of the neurilemma, similar to that which often arises in the tubular membrane of cerebral nerves, under pressure or rude manipulation, and upon examination shortly afterward, with greater magnifying power, a discoloration of the axis cylinder (or perhaps discoloration of some of the fibres of the funiculi themselves) was found.

This, in both cases, was essentially similar. The examination was not confined to this locality. All important organs were removed, and intestines opened at various points. No other peculiar appearances were recorded that could in any way bear upon the disease or its leading symptom.

The question then arose as to its origin. That it was peculiar to iron-clads seemed evident, and the imperfect ventilation, with presence of large quantities of both salt and iron in our drinking-water—the iron, indeed, so great, as to render it at times as dark as coffee, were the points to which especial importance was attached. The disappearance of the affection, when ventilation was improved and care taken to have the water somewhat freed from its impurities, seemed to favour the suspicion, but unfortunately ended speculation by summarily disposing of the disease.

Typhus in one or two instances, and typhoid in many, did indeed occur, but the symptoms in the other cases invariably were absent, and the diseases ran their usual course. To the many surgeons of both army and navy who were observers of cases, and of the dissections referred to, familiar as many of them were with typhus and typhoid in all their modifications, and in various climates, this disease was pronounced a stranger, and it is to be regretted that more numerous post-mortem examinations could not have been had, and better opportunities presented for observation and record. As before stated, it was not experienced in any but the first detachment of the iron-clad fleet. The whole number of cases possible to collect was between thirty and forty, and of recoveries among these, only six. Treatment was conducted upon general principles. The persons seized were of no peculiar habits or temperament, though it is but proper to state, what might be anticipated under the circumstances, the whole crew had soon become enervated and sickly. Diarrhœa, bronchitis, and an indescribable adynamic condition, with indefinite symptoms, were frequent.

The last division of this article is offered—though I am fully conscious of its incompleteness—that it may at least furnish data for comparison, should the future ever present cases of similar nature.

ART. IV.—*Comparative Advantages of Pirogoff's, Syme's, and Chopart's Amputations, and Excision of the Ankle-Joint, by Hancock's Method, after Gunshot Wounds and other Injuries; with Reports of Cases, and the Results; and proposing another Method for Excision of the Ankle-Joint.* By JAMES M. HOLLOWAY, M. D., Prof. of Anatomy in the University of Louisville, Ky.

THE April number of the London *Lancet*, for 1863, contains an interesting article, by HENRY HANCOCK, Esq., on the "Superiority of Chopart's Operation, and Excision of the Ankle-Joint." A comparison is instituted between these operations and those of Syme and Pirogoff, in which he decides in favour of the two first. As his experience, embraced by this article, is confined to the domain of civil surgery, it may not be uninteresting to pursue the subject still further, and see wherein his views are applicable to the class of injuries most usually encountered by the military surgeon. I will confine myself exclusively to the notice of those cases which came directly under my observation, and in which I was allowed the opportunity of seeing the final results. These reports will show that Pirogoff's and Syme's operations have not generally proved favourable, owing to various causes to be hereinafter mentioned. It is impossible to determine as to the propriety of the operation in each case, since most of them were performed previous to admission into hospital, and were unaccompanied by explanatory reports. Certain it is, however, that they were skilfully performed, and, as a general rule, were well cared for in their subsequent management. It will be seen that, in Pirogoff's operation, the non-union between the coaptated surfaces of the calcis and tibia was one cause of failure—the retraction of the heel, and corresponding depression of the anterior aspect of the stump, thereby throwing the cicatrix upon the sole, another cause. Inflammation of the sheaths of the tendons was not observed in most of the cases; in others, where this complication did exist, it did not impress me as being so serious an interference as Mr. Hancock found it. In one case, to be mentioned hereafter, these abscesses along the sheaths of the tendons were secondary to caries and necrosis of the sawn extremities of the bones, which caries and necrosis terminated in complete disintegration of the calcis and the spongy structure of the tarsal extremity of the tibia.

CASE I. A. B., a soldier, in good health, aged about 24 years, wounded in the fall of 1863, either at Chattanooga or Missionary Ridge; submitted to Pirogoff's amputation a few days afterwards; operation performed by Prof. Paul F. Eve, of Nashville, Tenn. The case was seen by me, for the first time, in the latter part of January, 1864. The flaps had united, but a number of sinuses communicated with the coaptated surfaces of the calcis and tibia, at the bottom of which denuded bone could be felt upon introduction of the probe. In addition to these, other sinuses, situated on the lateral aspects of the lower third of the leg, communicated with the sheaths of the tendons. These latter, as far as I could judge from the statements of the patient, appeared subsequent to those leading to the carious bones. The integuments overlying and adjacent to the diseased bone and inflamed condition of the sheaths of the tendons, presented a remarkably healthy appearance, so much so that the true condition of the stump did not transpire until a more thorough examination was made, while the patient was under the influence of chloroform. Such was the complete disintegration of the calcis and the end of the tibia, that amputation of the leg was necessary. This was done early in the month of February by Dr. Richard Taylor, of Memphis.

CASE II. R. H. Holland, Corporal, Co. B, 44th Regiment, wounded at Chancellorsville, on May 3d, 1863; submitted to Pirogoff's operation. Upon examination, on the 8th of July, 1864, fourteen months afterwards, I found the stump healed, but the parts were still swollen and œdematous; unable to walk without two crutches; heel drawn upwards, and cicatrix of flap thrown downwards and forwards, so that during locomotion it came in contact with the floor. No traces of the existence of inflammation of the sheaths of the tendons remained, and the bones seemed to be sound.

CASE III. V. B. Clark, private, Co. B, 12th Regiment, wounded near Spottsylvania C. H., May 10th, 1864; submitted to Pirogoff's amputation. On July 20th, 71 days afterwards, the soldier was able to proceed to his home in Georgia, though the stump had not entirely healed, and considerable tumefaction of the stump and leg still existed. The heel was drawn up, as in the above-named cases, and the tender cicatrix constituted a part of the sole of the stump.

I remember three other cases, of which I made no record at the time. One in which there was a double amputation performed on the field, by

Dr. John Taylor Gilmore, of Mississippi. Pirogoff's operation was done on one foot, and amputation of the other leg, I think, by Lenoir's method. The man died, but not before the flaps of the former operation had sloughed. In the two other cases, the cicatrices were thrown forwards and downwards by the retraction of the heel. The parts had healed, but the condition of the stump was not favourable for easy and painless locomotion.

I have seen only two cases of Syme's amputation, in both of which there was a bulbous condition of the stump, arising mainly from inflammation of the surrounding soft parts; the integument over the extremity of the bones was attenuated, adherent thereto, and presented a glazed appearance. It appeared to me that these cases promised unfavourably for the useful adaptation of an artificial foot. Amputation of the leg in its lower third would have been more propitious for easy locomotion.

I have recorded only one case of Chopart's amputation, rendered necessary by reason of a gunshot wound. I have examined others in which the results were equally as favourable as this one. In none of them had the tendo-Achilles been cut for the purpose advocated by Mr. Hancock.

CASE IV. John Shea, Letcher's Battery, aged about 45 years, wounded by shell on the 13th Dec. 1863, at Fredericksburg, requiring Chopart's amputation of left foot. Upon examination, on the 12th Dec. 1864, twelve months afterwards, the stump was perfectly sound; the tendo-Achilles had not been severed, and there was no retraction of the heel. He was on duty at that time as clerk in the Quartermaster's Department, and upon the morning that I made this note of the case, he had walked about two miles without pain.

The following is the history of a case in which I performed Chopart's operation during the fall of 1859, while a resident of Madison County, Mississippi:—

CASE V. Amos, servant of my partner, Dr. Thomas A. Phillips, aged 18 years; health vigorous; weight about 160 lbs.; complexion dark. On Saturday evening, about five o'clock, in the month of September, 1859, while in the act of rolling a bale of cotton from under the press, the "follower block," weighing about 100 lbs., fell the distance of eight feet, upon the heel of his left foot, almost the entire weight of his body resting, at that moment, upon the toes and ball. Upon examination, one hour afterwards, pulse depressed, extremities cold, pain in foot severe; bones of the metatarsus and tarsus, excepting the astragalus and calcis, badly crushed; integument on dorsal aspect, as high as the annular ligament, contused and lacerated. Having administered stimulants, he was conveyed to his quarters, distant about one mile; cold water dressings applied; a full anodyne administered; reaction not being fully established, night approaching, and the absence of surgical appliances, induced us to postpone further interference until the next morning.

Sunday, 10 A. M. Operation, seventeen hours after receipt of injury. Pulse 100; reaction complete; feverish; slept at intervals during the night; considerable swelling at seat of injury, extending up the leg; pain not intense. After the administration of a stimulant, chloroform was inhaled. The limb being supported by an assistant, I speedily disarticulated the scaphoid and cuboid bones from their posterior attachments, not regarding the preservation of an anterior, semicircular flap, because of the lacerated condition of the soft parts over the instep. The next step was to pass the catlin closely under the extremities of the detached tarsal bones, and include in the posterior flap all the tissues of the plantar aspect of the foot, extending the incision beyond the base of the toes. This completed the operation. No vessels required ligation. The flap was turned up and adjusted by interrupted sutures and adhesive strips to the lacerated soft parts on instep, and a retention bandage applied. The limb was elevated and supported by pillows, and cold applications ordered to be persisted in. Owing to the sthenic condition of the patient, febrile excitement ran high for three days, requiring prompt antiphlogistication. When the dressings were removed, the flap was found to be adherent throughout almost its entire extent. A small slough over instep, at site of laceration, was detached. From this time, repair progressed without interruption, and, in about four months, the boy was able to walk about with the aid of a crutch. A well-fitted shoe enabled him to use a hoe to an advantage. When I last saw him, in 1861, he was acting as teamster. The heel was very prominent, as is usual in the genuine African, which condition left him about four and a half or five inches of sole. The tendo-Achilles was not severed, and there was no retraction of the heel.[1]

I am not prepared to concur with Mr. Hancock as to the importance of this latter step in the operation. Careful examination of a number of cases operated upon by others, in which section of the tendo-Achilles was omitted, did not manifest the retraction of the heel, so particularly alluded to. Nevertheless, the authority for it is so distinguished, and the procedure so simple and safe, that no serious objection can be urged against it. From its omission in Pirogoff's operation, I have observed another bad effect—aside from affording, in some cases, a direct mechanical hindrance to the proper coaptation of the calcis with the tibia—viz., causing the cicatrix of incision to occupy the dependent portion of the stump. The reason why this should occur more often in the latter operation than in the former is obvious. In the latter, all the tarsal bones, except a portion of the calcis, have been removed. This fragment, moreover, has been carried forcibly forwards, out of its normal position, in order to coaptate the sawn surfaces of bone. All the tendons of the flexor and extensor muscles of the foot and leg, excepting the tendo-Achilles, have been severed—in front, above the tarsal extremity of the tibia; behind, on a line with the malleoli. In consequence thereof, being drawn still further up by muscular contraction, little chance is left for the formation of new attachments. In the former, on the other hand, the astragalus and calcis are left entire and *in sitû,* the lateral ligaments of the tibio-tarsal articulation, also the anterior ligament, remain undivided; the sheaths and tendons of the various groups of muscles have been severed some distance below the tarsal articulation, thereby affording an opportunity for the formation of attachments that will exert a powerful counteracting influence to the retraction of the tendo-Achilles. Until such an influence is established, retraction of the heel can usually be overcome by flexion of the leg and elevation of the limb, and the employment of retentive apparatus.

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[1] A letter from Dr. P., dated August 10th, 1865, contains the following: "You'll remember the boy Amos, upon whom you performed Chopart's operation? He is nearly as useful as before; indeed, there is no kind of work which he cannot do with ease. He possesses a perfectly sound and healthy stump."

I entertain the opinion that very few cases of injury (gunshot or otherwise) of the ankle-joint are met with in which excision is admissible. A large number recover, with useful limbs, without operation, and, in some cases, with remarkably free motion of the joint; and even where the tibio-tarsal articulation is fixed, increased compensatory motion of the tarsal and metatarsal joints occurs. I remember one case, particularly, in which the ball traversed the joint laterally (it must have been while the foot was extended upon the leg, and the anterior ligament was on the stretch); synovia flowed freely from the internal orifice; repair was effected without suppuration. Another case, wounded Sept. 19th, at Chattanooga, ball lodged in joint, beneath the anterior ligament. Inflammation ran high, and anchylosis resulted, with slight talipes equinus. During the following August, 1864, I removed the ball, by enlarging the sinus on instep. The healthy condition of the end of the tibia was surprising, the ball having lain in contact with it for nearly twelve months. The only immediate inconvenience resulting from its presence, was the repeated formation and discharge of small abscesses.

CASE VI. J. G. Clayton, private, 24th Regiment, Co. I, shoemaker, aged 22 years, wounded at Drury's Bluff, May 16, 1864. Gunshot wound, ball impinging upon lower end of tibia of left leg, glanced downwards, and passing through the anterior aspect of the ankle-joint, lodged under the skin over the neck of the astragalus. It was extracted on the 18th, two days afterwards. With the assistance of the rammer of his gun, he was able to walk to the rear.

May 23. Foot and ankle inflamed and swollen; pain excruciating upon slightest motion; grating of inflamed articular surfaces distinct; pulse frequent and irritable Ordered cold irrigation and anodynes.

June 1. After free incisions to favour the escape of confined pus (with which synovial fluid was freely mingled), and the persistent employment of cold irrigation, and anodynes, and suitable diet, the local inflammation has been subdued, and the general condition of patient is more favourable, though his appetite is somewhat capricious, and his digestive organs deranged. Abscesses in the neighbourhood of the joint continue to form and to be discharged; grating upon motion still distinct.

25th. Removed to private quarters to-day. Inflammation entirely subsided; motion of joint imperfect; general health much improved.

January, 1865. The patient still has imperfect motion of the joint, but is able to walk with the aid of a cane: wounds all closed.

In cases where the injury to the bones composing the articulation is more extensive, the ball, in its transit, making either a clean track through, or producing comminution of them, their spongy structure renders them peculiarly liable to rapid disintegration, extending oftentimes, before we are aware of it, to the contiguous bones. Under ordinary circumstances, it is impossible to appreciate the extent of this destructive process by the introduction of the probe, or by the appearance of the skin and soft parts. For in such injuries, as in most diseases, very little analogy exists between the condition of adjacent structures. While inflammation of one is in rapid progress, the other may enjoy a comparative exemption. Free incisions, to allow thorough exploration of the injured parts, are the only means by which the propriety of the operation can be determined. It may be that primary excision of this joint would be advisable, where the facilities for subsequent transportation are good, or what would be much better, where the patient could remain at the field infirmary, and obtain all necessary comforts and suitable diet. The experience afforded by this war, however, will show that primary excisions of the lower extremities have proved unsuccessful, owing possibly, in a measure, to the absence of these requisites. Such cases, consequently, come most frequently under the notice of the hospital surgeon, and he has to deal with them in their pathological condition. Mr. Hancock's remarkable success in the five cases he reports should impress us with the importance of a most thorough examination of each case, with a view to excision, before deciding upon amputation.

Great interest was manifested by myself and a number of my colleagues in the following case, which, for many days, was regarded as most favourable for excision. It will be seen how delusive were our hopes, so soon as the condition of the patient admitted of a thorough examination of the parts.

Case VII. S. H. Rawls, private, 11th Regiment, Co. D, general health good, aged about 24 years. On the 23d Oct. 1864, fell from a bridge, a distance of about forty feet, lighting directly upon his feet. The force of the fall was unequally distributed, and, in consequence, the right ankle was severely crushed, while the left escaped with a slight sprain. High inflammatory excitement followed, placing his life in great peril. The symptoms abated about the thirtieth day, leaving him very much prostrated. Abscesses formed in the neighbourhood of the joint, involving the sheaths of the tendons. A constant discharge of pus flowed through numerous sinuses which communicated with the joint. A vertical section of the outer half of the articular surface of the astragalus came away in January, 1864. Cold applications, alternating with poultices, were employed, together with the usual supporting treatment. My attention was called to the case about the 10th of January. The attending physician stated that the patient had been declining for two weeks; experienced an exacerbation of fever daily; abscesses were forming in rapid succession, and the drainage of pus was very profuse. Upon examination, I found a number of sinuses communicating with the joint, and quite a free opening over the external malleolus, through which the large fragment of the astragalus had escaped. This was the only fragment of bone that had come away. The surrounding soft parts were infiltrated and tumefied, pitting upon pressure; the tumefaction was limited to the parts immediately around the joint, only slight œdema of the metatarsus and leg being observed Except during the formation of an abscess, he was free from pain; a dull, aching sensation followed motion of the joint or the introduction of the probe; the probe passed freely through the joint, emerging through sinuses on the opposite side; very little roughness could be felt, and that confined to the anterior portion of the joint; above, and behind, and below, the end of the probe glided smoothly over the opposing surfaces. The case seemed favourable for excision, and upon consultation with Prof. Peticolas, Drs. Palmer, Rives, and others, it was decided that the patient's general condition should be improved, and when he was in a condition to undergo an operation, free incisions should be made, with a view to ascertain the exact condition of the bones composing the joint, and be guided thereby in the selection of the operation. Accordingly, on the 4th of March, 1865 (four months and ten days after receipt of injury), the general condition of the patient having improved, he was placed upon the table, given a stimulant, and anæsthesia produced. The sinus on external aspect of the joint was enlarged by a curvilinear incision, and the parts explored with the finger. Only a small fragment of the astragalus remained, the rest having come away by particles; the calcis was invaded, and the cuboid and scaphoid bones were in a softened condition; the ends of the tibia and fibula were inflamed, and both malleoli, fractured by the fall, had reunited; the periosteum was entire, and a part of the cartilage which entered into the formation of the tibio-tarsal joint remained. The extent of the caries and necrosis dissipated all hopes for excision, and the leg was amputated in the lower third by Lenoir's method. It is not improbable, if the condition of the injured parts had been critically examined at an earlier date, that the caries and necrosis would have been found to involve only those bones which constitute the joint, and which had suffered primarily from the force of the fall.

On the 21st of June, 1864, I excised the ankle-joint by Hancock's method. The following is a history of the case:—

CASE VIII. J. T. McGniffin, private, Co. B, 24th Regiment, farmer, aged 23 years, general health good, fair complexion, hazel eyes, dark hair, wounded May 16, 1864, at Drury's Bluff. Gunshot wound (minié) of right ankle-joint, ball entering in front of and on a line with internal malleolus, passed through astragalus, and made its exit through external malleolus, carrying with it a number of fragments; synovia escaped. Also, gunshot wound, fracturing fourth metatarsal bone of right foot.

May 23. Very feeble and exhausted from constant pain, restlessness, and loss of sleep; foot and ankle inflamed and swollen; spicula of bone presenting at orifice of exit; abscesses forming around and involving the joint. Directed cold irrigation; limb suspended in Smith's anterior splint, to allow motion of body without disturbing injury; grating distinct in joint upon the least movement. Amputation of the limb, advisable as a primary operation, was not admissible at this date.

26*th*. Opened abscesses on internal aspect, which discharged pus freely, mingled with synovia; also another one connected with injury to the metatarsal bone; continue ice-water irrigation.

June 1. Parts still swollen and inflamed; discharge of pus free; abscesses still forming; spicula of bone removed from day to day, as they become detached; appetite capricious; sleep unrefreshing; pulse frequent and irritable; fever constant. Anodynes, and such nourishment and stimulants as are tolerated.

3d. Swelling and tension somewhat subsided; irritative fever continues; discharge of pus free from abscesses and wound of exit; cold drip constantly applied. F. D. and anodynes to secure rest.

6th. Substituted linseed poultices in place of cold irrigation, and turned foot upon its outer side, so as to admit of free drainage.

7th. Heat and swelling subsided after copious discharge of pus, with marked relief from pain; passed a comfortable night; continue poultices, to be renewed every six hours.

8th. Removed a number of small fragments from wound of exit; quite a large, loose fragment felt under the skin on dorsum; pulse still irritable.

10th. Discontinue poultices; dress wounds with cerate, and apply roller bandage; more comfortable; wound of exit discharging freely; no spicula presenting.

11th. Slight increase of heat since removal of poultices; complains of pain in leg; discharge still free; sitting up in bed; continue cerate dressings and bandages.

13th. Removed several small fragments of bone from wound of entrance; all the openings filling up by granulation; discharge encouraged by keeping orifice of exit patulous; marked improvement in general health; cheerful, rests well, and begins to relish his diet.

18th. Considerable heat and swelling (œdematous) came on suddenly; required constant cold bathing to subdue pain; discharge of pus diminished but still benign; probe passes freely through astragalus; fever, with intense thirst; granulations in orifice of exit luxuriant, and bleed upon least irritation; glands in right groin enlarged; bandaged ankle and foot tightly, and painted glands with tincture of iodine; stimulants and nutritious diet.

19th. Found patient more comfortable; passed tolerable night; no chill, the occurrence of which is apprehended; fever and pain subsided; a streak along course of lymphatics (superficial) on internal aspect of leg and thigh, extending from ankle to enlarged glands, not visible throughout, but traced by stinging sensation upon slightest pressure; œdema reduced by bandaging; discharge of pus more copious; no evidence of the formation of abscesses.

21st. Upon consultation with Drs. Habersham, Browne, and Baylor, Hancock's excision of the ankle-joint was agreed upon.

Operation, June 21st, 4 P. M. Patient was directed to abstain from food, but it was ascertained subsequently, by ocular evidence, that he had eaten heartily at 2 o'clock P. M. Chloroform administered by and under the superintendence of Drs. Wiley and Habersham. Yielded readily to the influence of the anæsthetic. The directions of Mr. Hancock were followed as closely as the peculiarities of the case would allow. An incision was commenced two inches above and behind the external malleolus, and carried across the instep to the point behind and two inches above the internal malleolus. This flap, including the skin only, was carefully reflected. The fibula was exposed by detaching the peronei tendons from their sheath and groove; the lateral ligaments had been severed by the ball, and the greater portion of the external malleolus carried away. With a pair of strong nippers, the bone was severed about one and a quarter inch above the end and removed. This was effected with difficulty, because of the inaccessibility of the interosseous ligaments. The foot was then turned upon its outer side, with a view to the isolation of the end of the tibia, when it was suddenly announced that the patient was pulseless; vomiting occurred, and a large quantity of undigested food was ejected. It was ascertained, by examination of the receptacle, that, up to this moment, the patient had lost only about six ounces of blood; neither vein nor artery had been severed. The operation was suspended, and efforts were made to bring about reaction by the application of sinapisms to epigastrium, wrists, and inside of thighs, and the administration of ammoniæ carbonatis, and whiskey per rectum, and hot toddy by the month. After the lapse of forty-five minutes, no visible reaction occurring beyond increased sensibility and an occasional pulse at the wrist, it was thought best to complete the operation without delay. Accordingly the tendons of the flexor sublimis and tibialis posticus were carefully detached, the internal lateral ligaments severed, the foot forcibly dislocated outwards, and one inch of the end of the tibia removed. The foot was turned down, a bandage passed in front of tendons, nerves, and vessels, was drawn firmly backwards to secure them from injury, and the greater portion of the astragalus, not including its neck, was removed with a metacarpal saw. The operation was completed without injury to nerve, vein, artery, or tendon. The flap over instep was replaced, and secured by interrupted sutures, the lateral incisions left open, and the limb fixed upon a T-splint, and bandages loosely applied. The patient was not removed from the table; strong, black coffee, alternating with milk-punch, was administered every twenty minutes. 11 P. M., pulse more distinct, and extremities warmer; very restless; gave half a grain of morphia, and repeated in a half hour; after this he slept at intervals during the night, and at 7 A. M. the next day he was rational; vomiting ceased; pulse distinct, and, with an assistant to conduct the maimed limb, was able to move himself from the table to a litter, and from the litter to his bed.

June 22. Toes cold; absence of sensation; complete stasis in circulation. Ordered gentle friction; turpentine stupes and bottles of hot water. Removed dressings, and found sensation perfect as far as base of the metatarsus, except in the skin flap on dorsum, which has commenced to slough; the subjacent tissues are active. The bloodvessels having been uninjured, I am convinced that the imperfect circulation in the foot is owing to his asthenic condition (the other foot is cold), and the bad effects of the chloroform which may, in a measure, be attributed to an overloaded stomach, and the severe shock incurred by the completion of the operation without anæsthesia. Evening: pulse distinct at the wrist, but feeble and quick; occasional clammy sweats; voice strong; respiration regular, and without sighing; intellect clear, and mind tranquil. Ordered French brandy every two hours, with chicken soup and buttermilk.

23*d*. Slept well during the night until 1 A. M, then became restless; occasional delirium; skin flap on dorsum sloughed and removed; wounds unhealthy; clots and thin sanies discharging; gangrene of the toes in progress. Egg-nog and nutritious diet.

24*th*. Transferred to tent this morning; tissues over instep active and sensitive; the line of demarcation encircles foot below instep, including the heel. Continue supporting treatment.

25*th*. Until late yesterday the patient seemed to be more comfortable; for supper he relished a large glass of buttermilk. Ordered morphia to secure rest. Patient died suddenly and unexpectedly to the attendants at 6 o'clock this morning. I could not ascertain the immediate cause of the sudden change. It was hoped that his condition would in a few days be favourable for amputation of the limb, which would have been done in the first place, if the patient could have borne the loss of blood usually encountered.

In conclusion, I will notice briefly the particular method by which Mr. Hancock performs excision of the ankle-joint, and suggest a modification. His rules were strictly followed in the case above described. As a particular step in the operation, he directs that the lateral incisions behind the malleoli be connected by an incision across the instep, merely dividing the skin, and that this flap must be reflected. This incision through the skin, and consequent reflection of the flap, is, in my opinion, altogether unnecessary, and for that reason, amongst others, must be, in accordance with general rules, hurtful. The object of this incision and reflection of flap is presumed to be, to increase the size of that part of the aperture through which the tibia is exposed and isolated by forcible eversion of the foot. But this presumption is not correct, for repeated and careful experiments upon the cadaver during the past winter, in presence of Prof. A. E Peticolas and Dr. H. L. Thomas, of the Medical College of Virginia, go to prove that the incisions, as described by Moreau, Sen., afford ample room for the facile accomplishment of every step required during the whole procedure. Furthermore, Mr. Hancock cautions the operator to be careful to avoid wounding the dorsalis pedis artery, and to include in this incision nothing but the skin. Consequently, after the flap has been reflected, we still have in front of the joint, and lying in contact with the end of the tibia, the anterior group of tendons, their sheaths, the confining ligament, and aponeurotic expansion, all of which clearly offer greater impediments to the isolation of the bone than the mere skin. I object, then, to this part of the operation, because, as stated above, it does not facilitate the isolation of the bone, nor secure ampler space for manipulation; also because of the danger of wounding the dorsalis pedis artery, which, to my knowledge, was severed by an experienced and skilful operator during the performance of the operation; also because of liability of the sloughing of the flap, as occurred in Case VIII.; and because, finally, even where the risks, named above, have been avoided, and a successful result ensues, a cicatrix is left upon a prominent point which will, to say the least, render the wearing of a shoe very uncomfortable.

I would, then, suggest that this part of the operation be omitted, and that the incisions be made as follows, viz: longitudinal incisions close to the posterior border of the fibula and tibia, commencing from two to three inches above the malleoli; from the inferior edges of these make others directly forwards at right angles, extending on the outer aspect of the foot, as far as the tendon of the peroneus brevis; on the inner aspect, as far as the tendon of the tibialis anticus. By dissecting up these angular flaps, we have ample room for the removal of the end of the fibula by the bone-pliers, the eversion of the foot, and consequent isolation and removal of the end of the tibia. The subsequent removal of the injured portions of the astragalus, or, if necessary, the whole of it, will be comparatively easy.

In justice to myself, I should state that the experiments upon the cadaver, which lead to these conclusions, were instituted without any knowledge of the operation as laid down by the elder Moreau, although alluded to by Mr. Hancock in his article. Subsequently, while searching for information upon this subject, with a view to the preparation of this article, I came across the procedure of the elder Moreau in Malgaigne's *Operative Surgery.* It will be observed, by referring to it, that he does not recommend the eversion of the foot in order to facilitate the removal of the end of the tibia. For this latter modification, and the connection of the vertical incisions across the instep, we are indebted to Mr. Hancock. The one I deem an important improvement. In regard to the other, I am sure, upon reflection, Mr. H. will agree with me that it is entirely unnecessary, and, in consequence, unwarrantable.

ART. V.—*On Symptomatic Bronchial Irritation.* By A. P. MERRILL, M. D., of New York City.

OF the number and severity of diseases of the respiratory organs which cause great mortality, a larger proportion than is generally supposed have their origin in derangements of the digestive and uterine systems, of which they are symptomatic. These cases simulate bronchial irritation from other causes so closely, that it is not always an easy matter to discriminate between the idiopathic and symptomatic affections, and the disease in both forms is often mistaken, in its latter stages, for tubercular phthisis. Not unfrequently is it the case, indeed, that in strumous subjects the predisposition to tubercular phthisis finds its development in the influence of bronchial irritation as an exciting cause, and without which such predisposition might have lain dormant for a lifetime. The prostration of vital energy which is the common effect of mucous disease under every form, is well calculated to invite this development of phthisis, which is only restrained in tubercular subjects by invigoration and tonicity. Hence the frequent occurrence of tubercular phthisis as a sequela of enteric or typhoid fever, especially if active disease of the mucous tissue be long continued.

Symptomatic bronchial irritation generally has its origin in various causes acting previously upon the mucous membrane of the digestive organs. An undue and long-continued indulgence in the use of stimulating food, alcoholic drinks, tobacco, opium, capsicum, and all those indulgences and excesses common to good living, tend to derange the functions of the mucous membrane of the digestive organs, causing indigestion, disorder of the bowels, and general debility, with vitiated secretions throughout the intestinal tube, and resulting in bronchial irritation as a symptomatic affection, which is likely to lead rapidly to a fatal result.

More commonly still, perhaps, are those primary derangements of the mucous tissues due to sedentary and inactive habits of life, causing an undue determination of blood to certain abdominal viscera, and consequent congestion of the mucous membranes lining those viscera, and this is followed sooner or later by a similar condition in the linings of the bronchi under the influence of sympathy. Numerous classes suffer in this way. Men who are confined to the labours of the counting-house, whether sitting or standing, or in sedentary mechanical labour, whatever may be their habits in regard to eating and drinking, are very liable to suffer from indigestion and constipation. More commonly still do women of sedentary habits, sewing girls who sit at their work in close and overheated rooms twelve or thirteen hours a day, and factory girls whose occupation requires them to stand an equal length of time, contract habitual constipation, accompanied by great torpor and hyperæmia of the mucous membrane of the colon and rectum. In females this condition is soon communicated by sympathy, to the mucous membranes of the organs of generation, causing first excessive, then deficient, and finally a total suspension of menstruation, subtituting those serous exudations which generally accompany hyperæmia of the mucous membranes. In all these cases of disorder arising from vicious habits, the powers of digestion are impaired, and the irritation produced in the mucous membrane of the digestive organs and uterus, is communicated to the sympathizing mucous tissue of the bronchial tubes, and the subject lingers and dies, a victim to imprudence and neglect.

I have mentioned the habitual use of tobacco as one of the causes of disease in the mucous tissues, and we have abundant proof that they who use it by chewing, smoking, and snuffing are sufficiently punished for the unnatural indulgence, by impairment of health. But there is a more injurious method than any of these, in which tobacco is habitually used, and which has not been sufficiently noticed by medical authors. It is commonly called "*dipping.*" There is a large portion of the Southern States, embracing North and South Carolina, Tennessee, the northern parts of Georgia, Alabama, Mississippi and Louisiana, all of Arkansas, and a considerable portion of Texas, in which this habit prevails among females, and is handed down from mother to daughter as a hereditary curse. It is confined, so far as I have observed, to the female sex, and consists in applying snuff, mostly fine Scotch snuff, to the teeth and gums by means of a sort of brush made of a stick or a piece of hickory bark, chewed into a brush-like form at one end. This is moistened, dipped into the dry snuff, and thus the powder is conveyed into the mouth in any quantity desired. Those who have been long addicted to the habit carry the brush pretty constantly in the mouth with one end projecting from the lips.

The better classes are more careful to escape observation, but the habit grows upon those who indulge in it until it becomes the most inveterate of any connected with the use of narcotics. Reformations are exceedingly rare, and the victims find it difficult to substitute the use of tobacco in any other form. Chewing, smoking, and snuffing will not satisfy the cravings of the unnatural appetite. The mucous membrane of the whole intestinal canal becomes plastered with a pasty coating of snuff-powder, as I have ascertained by autopsic examination, and it seems necessary that this coating be maintained or a state of wretchedness ensues which greatly unsettles the mind. The skin after a while assumes very nearly the colour of the snuff, so that from this alone dippers are readily distinguished. The circulation of blood in the skin becomes sluggish, no longer responding readily to displacement by pressure, or to that nervous influence which causes the modest blush. The conjunctivæ are also tinged by the colouring matter of tobacco, and the vision of youth prematurely fails. Deafness is not an uncommon effect of this habit, and the whole nervous system appears so impaired in healthful vigour, as to affect every sense and every function of the body.

The mucous membrane of the internal organs of generation becomes diseased and the uterine functions impaired. The cervix and body of the uterus are swollen, while the vagina and suspensory ligaments are relaxed, giving rise to prolapsus and other displacements. Miscarriages are common, child-bearing sometimes ceases entirely, and there is reason to believe that children born of such women rarely fail to suffer, both in body and mind, the degenerating influences of this vicious habit of their mothers.

In nearly all these cases the stomach performs its office imperfectly, and the woman is subject to obstinate fits of indigestion and vomiting, ejecting not only the food and secretions, but the snuff which has accumulated in that organ. The bowels are torpid and habitually constipated, with occasional alternations of diarrhœa. The secretions are vitiated and mostly discoloured, like the skin and mucous membranes. The mind becomes irritable, dejected, and perverted, causing discontent and unhappiness, and the whole system is debilitated, with emaciation and œdematous swellings. Remedial measures fail to produce anything more than temporary relief while the cause of all this disorder is continued, and, as in other cases of nervous and functional disturbance of the mucous tissues, the life of the patient is sometimes ended by tubercular phthisis, or by symptomatic bronchial irritation closely simulating that dreadful disease; and in either case the term consumption is applied.

Independent of the influence of this vicious habit, idiopathic disease of the mucous membrane of the organs of generation is probably the most common form of what is called uterine disease, and the form which is most likely to involve the derangement of the digestive and respiratory functions by sympathy. The sympathy so well understood to exist between the uterus and the stomach, is scarcely more intimate than that between the stomach and the lungs, and nothing is more common than to meet with evidences of such sympathies in the management of the diseases of these several organs. It is a complication to be closely studied, and it is an error, I apprehend, to suppose, that these diseases of the mucous tissues can in general be cured by local treatment alone. There can be no doubt of the usefulness of iodine and nitrate of silver as local applications to the throat, the bronchi, and the uterus, if not also to the coats of the whole intestinal canal; but that long-continued and chronic disease of these mucous tissues are to be cured by such limited means, ought not to be expected, and the hope is, in my opinion, not often realized. Probably the common dependence upon such local treatment has been encouraged by the practice of specialists, who, whatever may be the extent of their knowledge of pathology in general, are apt to confine their attention pretty much to the local affection they are accustomed to treat. The mucous tissues are too important a part of the animal economy, too closely associated among themselves and with other tissues, by nervous sympathy, and too influential in their functional relations, and over glandular and nervous action in general, and over the constitution of the blood, to be restored to health in all their parts by any remedies that can be applied to certain mucous surfaces. Sad mistakes are made in regard to this matter, prolonging the sufferings of patients, and leading in many cases to a fatal issue, either in true phthisis, or in symptomatic bronchial irritation closely resembling phthisis.

The bronchial secretion caused by symptomatic irritation is not to be confounded with that of pulmonary catarrh or with bronchorrhœa, which are either idiopathic affections, proceeding from some external cause, or the sequelæ of bronchitis, and are not necessarily dependent upon disorder of other mucous tissues. These preternatural discharges from the respiratory mucous membrane, caused by local excitement, may be acute and temporary, as in a common cold, or chronic and enduring, sometimes continuing even for a lifetime, and with scarcely more injury to the general health than the reduction of physical strength which results from excessive secretion. Nor is this symptomatic disease to be mistaken for that which is now so common and fatal, a sequela of imperfectly cured pneumonia. This simulates phthisis, perhaps, still more closely than the bronchial or membranous affection, but proceeds, mainly, from hyperæmia and hypertrophy of the parenchyma, resulting in ulceration and the formation of vomicæ, sometimes in atrophy. Since pneumonia has, more than formerly, come to be treated upon the expectant plan, and with much alcoholic stimulation, and especially when, in malarial districts, the periodic character of the disease is ignored in the treatment, this sequel would seem to have become more common, and it is some confirmation of this view that mortuary reports show an increase in the proportion of cases of consumption.

It is all the more important to be able to discriminate between the idiopathic and symptomatic disease, because the treatment indicated in the two cases is in some respects different. The irritation existing in the mucous membrane of the throat and bronchial tubes, as well as in the parenchyma of the lungs, the effect of fever, of tuberculosis, or of stimulating vapours, finds remarkable relief in the proper employment of opiate remedies. The reason is, perhaps, that this irritation exists independently of any considerable derangement of the secretions connected with the process of digestion. I have generally found that whenever these are much impaired by febrile disease or other cause, opium is more or less injurious, because of its tendency to intensify the difficulty.

Now the cough mixtures in common use, and especially those which are sold so abundantly, and bought so anxiously by this class of patients, as secret nostrums, are nearly always dependent upon opium in some form for their beneficial effects. The sufferer from bronchial irritation generally finds sufficient encouragement in their continued and habitual use in the fact that they do allay to some extent the troublesome cough, and secure for the patient a considerable degree of comfort and repose. In many cases too there is, connected with indigestion, such persistent diarrhœa as encourages the use of these opiate mixtures to restrain it. Nothing appears more reasonable, therefore, as certainly nothing is more common, in these disorders of the mucous tissues, than that the patient, and sometimes the physician also, should attach importance to these cough mixtures as proper remedies for every kind of bronchial irritation. However suitable they may be to the disease existing in the respiratory organs, their inevitable effects are, to increase the morbid condition of the mucous membrane of the digestive system, and to restrain the healthy secretions of the liver and kidneys.

But the particular form of disease to which I wish to invite attention is, that continued symptomatic irritation of the pulmonary mucous membrane, causing first increased natural secretion and expectoration, and afterward more copious vitiated bronchial discharges, the effect of primary irritation of the mucous tissues of the organs of digestion and generation. Whenever this symptomatic disease becomes established in the lungs and throat, other abnormal affections soon appear in the glandular structures sympathizing with the mucous tissues. The skin becomes dry and husky, and sometimes desquamatorious; the urine scanty, high-coloured, often tinged with blood, and the bladder so irritable as to require that it be frequently discharged, and the stools afford evidence of a want of bile and of healthy intestinal secretions. There is dryness of the tongue, with a smooth and florid surface, often disfigured with fissures and patches, viscid saliva, perversion of the sense of taste, hardness, tenderness, and more or less tension of the abdomen, intestinal flatulence and obstinate constipation sometimes attended with diarrhœa. In females the uterine functions are first impaired and then suspended, with the frequent concomitants of constipation and hæmorrhoids.

In adopting a plan of treatment for this complicated and difficult disease, regard must be had to its history. The portion of mucous membrane first disordered is apt to be the most troublesome to manage, and it often happens that nothing more than a temporary alleviation can be secured while the original complaint remains unsubdued. In a large majority of cases of disease of the mucous tissues, the digestive organs are primarily affected, even when in its progress the most obstinate feature is the uterine or bronchial disorder. It sometimes begins in the stomach, constituting a form of dyspepsia, and sometimes in the large intestines, quickly affecting by sympathy the lining membrane of the uterus and vagina.

It is not my intention to describe all the different stages of the disease, or refer to all the remedial measures to be applied, which would extend this article to an inconvenient length ; but there are anomalies in both the disease and in the action of remedies, which it is of importance to notice. The susceptibility of the bowels to the influence of cathartics, when the principal irritation is confined to the stomach and the small intestines, and the reverse condition when it originates in and is principally confined to the rectum and colon, is remarkable. In the former case, small doses of mercurial medicines are effective as both alteratives and cathartics, but in the latter, there is a specific virtue in aloes, which gives it great prominence as a remedy, and especially in view of its influence over the uterine disease so commonly existing as a symptomatic affection. Aloes may be used either in the solid or the liquid form, and in either case I have generally found the ancient compound of aloes and canella the best. It may be given in pills or in tincture, but in some cases, especially in those giving rise occasionally to copious watery stools, myrrh becomes a good adjuvant remedy. I suspect it to be a mistake to suppose that aloes frequently causes hæmorrhoidal affections. The rectal secretions become somewhat acrid under its influence, and, when long continued, it sometimes causes soreness, pain, and even swelling at the verge of the anus, but these soon disappear when the remedy is suspended. The affection is not hæmorrhoidal in its character, but, on the contrary, aloes is among our best remedies for this disease. The counter-irritation and relief of constipation produced by aloes, acting, as it does, mainly on the mucous membrane of the rectum, has an important remedial efficacy in the cure of both the uterine and the bronchial irritation, symptomatic of the intestinal disease.

Without pursuing this discussion to an inconvenient extent, I shall endeavour to subserve my original purpose by presenting, somewhat in detail, a remarkable case of what I have considered symptomatic bronchial irritation, cured by a very simple course of treatment, and illustrative of my views in reference to this disease occurring as a consequence of indigestion from imprudent living.

On the 7th of October, 1855, I was requested to visit Colonel K., an old and experienced merchant of Memphis, Tenn., in consultation with three other physicians, all of whom had been in attendance on the case previously. The disease was called pulmonary consumption. The patient was emaciated, exceedingly feeble, with quick and weak pulse, laboured breathing, speaking only in almost inaudible whispers, loathing food, and expectorating largely. The matter expectorated was of a viscid, semi-purulent character, of a brownish colour, and intolerably offensive odour. Presuming that his physicians were correct in their unfavourable prognosis in this case, and not believing that I could render any valuable assistance, I begged to be excused from any agency in the treatment, and was about to withdraw, when I was informed that it was the earnest wish of the patient and his friends that I should take the sole charge of his case. To this I objected, as it seemed little short of folly for me to undertake the treatment of a dying man, who was already provided with a superabundance of able medical counsel. But the importunities of the patient and his friends were strong, and all the attending physicians concurring, I consented.

When left alone with my patient, I found his physical powers so exhausted, and his condition apparently so hopeless, that I hesitated whether I should attempt to do anything more than try to sustain and comfort him during the brief period that he seemed destined to survive. It appeared to me, indeed, that impending dissolution was so imminent as to preclude the propriety of active medication. But upon making such examination of his chest as he was able to bear, and learning the history of his disease, I had reason to suspect that it had been primarily a dyspeptic affection, and that the existing bronchial disease was symptomatic. I soon became convinced, too, that no part of the expectorated matter was the product of abscess in the lungs, as had been supposed. I administered half a grain of calomel and a drop of creasote, advised brandy and nourishment, most of the latter being by enemata, and left him for the night, half inclining to the belief that he would not survive until morning.

Early the next morning I found he had had a large, feculent, and very offensive stool, without increase of prostration, but he declared that he had passed the night without sleep. His loathing of food was somewhat less than it had been, his wife expressing surprise that he did not retch to vomit on her approaching his bedside with a cup of tea. I now gave him a quarter of a grain of calomel, with a drop of creasote, and advised the continuance of the brandy and nourishment as before. I arranged, also, for a moderate inhalation of the vapour of iodine every two or three hours. In the evening he appeared a little improved, having had two dejections from the bowels of the same kind as before, and succeeded in retaining a cup of chicken broth; but he expressed the opinion that my doses were too strong for him. Advising the continuance of the iodine inhalations, and repeating the creasote, I left him for the night without other remedies. His expectorations had been, hitherto, nearly a quart in twenty-four hours, the larger portion being at night. On this occasion he repeated his expressions of confidence in my treatment, and whispered in my ear, by way of encouragement, "I am a good deal better."

During the night his bowels acted three times, not largely, but he felt the prostrating effects, and said, "That little pill you gave me must have been very strong medicine." His expectoration had been somewhat less copious, and the sputa were less offensive to the smell. I now repeated the calomel, a quarter of a grain, and gave one-fifteenth of a grain of strychnia. The latter was repeated three times during the day, and a drop of creasote was given with each dose. He used the iodine inhalations more freely, under the impression that they gave relief to his cough, and more nourishment was taken into his stomach, and retained. Still he had a disrelish for all kinds of food, was unable to raise his head from the pillow, and could speak only in whispers. At night he had had no further action of the bowels, and his expectorations were less copious. The calomel was repeated, and the strychnia, creasote, and iodine inhalations were continued.

He had two stools during the night, which, without being watery, were thin, of a yellowish colour, and much less offensive to the smell. His expectorations had been less copious and offensive, and he said he had enjoyed some refreshing sleep. For the first time, he now expressed a wish for food, but, after eating a little, he pushed the food away, and said, "I have no appetite after all." From this time onward the calomel was continued in doses of one-quarter of a grain, morning and night, strychnia, in doses of one-fifteenth of a grain, and one drop of creasote was given three times a day, together with iodine inhalations. His bowels were moved two or three times daily; his appetite improved, the expectoration steadily decreased and lost its offensive odour, and he gradually recovered his voice.

When he had continued this course for ten days, he declared that he was unable to restrain his appetite, and he gained strength rapidly, taking, for more than a month afterward, one-third of a grain of calomel every night, to the exclusion of other remedies excepting the iodine inhalations, which were continued. His cough disappeared entirely, and his health became better than it had been for many years previously. He died some years afterward, without any return of the pulmonary disease.

In this case the disease originated in the stomach and small intestines, and the mucous membrane of the colon and rectum did not appear to be disordered to much extent. It was a remarkable case of symptomatic bronchial irritation, baffling the diagnostic skill of able physicians. The remedial efficacy of small doses of calomel in restoring the impaired secretions is strongly exemplified in this treatment. While the treatment was designed for the relief of bronchial irritation, without reference to the original disease, the severity of which may, indeed, have been enhanced by the use of anodyne expectorants, there could be no hope of a permanent cure, which was effected by directing the remedial measures mainly to the relief of the digestive organs.

This patient had for many years been a free liver, gradually impairing the tone of his stomach and bowels, and disturbing the healthy functions of the nervous system, by imprudent eating and drinking and the use of tobacco. This it was, in my opinion, which caused the bronchial disease by sympathy, causing an inordinate amount of vitiated secretion, and extensive dilatation of the bronchial tubes.

Although the disease in this form is very formidable and exceedingly dangerous, the others to which I have referred appear to be more difficult of management and cure. Scarcely can we expect, by any means now known, to control the disease when it has proceeded to such extremity as in the case related above, by sympathy with affections of the mucous linings of the large intestines and uterus. For some reason, of which I am ignorant, the derangements of the nervous system in these cases are more serious and persistent, while the remedies employed in the gastro-enteric disease fail to afford the same relief. There is, in general, as I have intimated, obstinate constipation to contend with, and there is also an engorgement or hyperæmia of the lining membrane of the uterine cavity and cervix, rendered more obstinate and persistent in most cases by displacement, and especially by prolapsus; but even when these evils have been to a considerable extent subdued, the bronchial disease is very apt to continue, causing large expectoration of frothy mucus, accompanied by frequent and feeble pulse, pain in the thorax, red and sometimes swollen tongue, and rapid loss of flesh and strength. Aloes, calomel, creasote, turpentine, strychnia, and various narcotic remedies, to allay nervous irritation, may produce beneficial effects, and sometimes give permanent relief, but in too many cases the disease goes on, and results in death for the want of means of cure which have not yet been discovered.

ART. VI.—*On Puerperal Tetanus.* By WM. A. GORDON, M. D. Read before the Bristol South District Medical Society at New Bedford, Mass.

THREE cases of puerperal tetanus have occurred in my practice during the last five years, and they are the only instances I have had the misfortune to meet with during my professional life of now thirty-five years.

The first case occurred in a healthy, temperate Irishwoman, the mother of four children. I was called to her on Sunday afternoon, August 7th, 1859. I learned that she had aborted on Wednesday at an early period of pregnancy, eleven days previous to my visit. The abortion was not attended with very much pain or flooding, and the woman kept her bed only till the afternoon of the next day, Thursday. Since that day she had attended to the duties of the household. Upon the Monday following she went a short distance to market, bringing home a heavy basket of provisions without unusual inconvenience. On Wednesday evening, a week after her abortion, she sat a considerable time at the outside door upon the door-sill, her feet resting upon the stone doorstep. On the following day, Thursday, she made complaint of pain in the head, which extended to the jaws and throat. She took a dose of castor oil which operated on Friday, and from that time till Sunday she was using various remedies prescribed by the old women and midwives. At the time of my visit (Sunday) she complained of a painful stiffness of the jaws, which came on first, and had extended to the muscles of the back, between the scapulæ, and to the throat.

She could not open the mouth to protrude the tongue, and swallowing was difficult. Her intellect was unaffected; pulse natural; skin warm and perspiring. The lochial discharge had quite ceased. There was no pain of the back, or any symptom of metritis.

On Monday the muscles of the back of the neck became stiff and contracted, while those of the back were slightly relaxed. During the following days the tetanic spasms, which the patient called "cramps," increased, producing opisthotonos, and extending to the larger muscles of the limbs. Her condition at this time was very distressed, the spasms being severe, sudden, and extensive. She suffered much from the accumulation of phlegm in the throat which threatened suffocation, and was with great difficulty expectorated. She got very little sleep; complained much of general distress occurring in exacerbations. Her pulse became quicker and small, and her death occurred on Thursday afternoon. I was at this time not quite certain as to the nature of the case, it being the first one of this rare disease which I had seen.

The treatment consisted of purgatives of senna and salts, the application of large mustard poultices and hot fomentations to the scapular regions, with opium and calomel at bedtime, with an increase of the quantity of opium and of the doses as the spasms became more severe. These were discontinued, as she failed to swallow them, on Wednesday afternoon, and etherization resorted to. But she declared that it increased her distress, and refused to use it after I left.

The second case occurred in May, 1863. This patient was a mother of five children, a farmer's wife of excellent health and habits, aged about 40, I think. I was called to her on the evening of the 25th. She complained of pain low in the back, extending through to the abdomen, constant, at times aggravated. The abdomen was enlarged and tender, and she had considerable fever, also some hemorrhage from the uterus, though not severe. To my question whether she was pregnant, she replied that she did not know, but if she were, she should prefer to abort, and desired me to do nothing which should prevent it.

My treatment was directed to the removal of the symptoms of metritis, as I considered; and it was continued till the 28th, when I took leave of her. She was then free from pain and fever, and had only moderate hemorrhage; but abortion had not to my knowledge occurred.

About thirty-six hours after this last visit, on the evening of the 29th, I received another summons, and then found my patient complaining of stiffness of the jaws, neck, and throat. This soon extended to the muscles of the back, and all became affected by severe and painful tonic contractions. The trismus was especially distressing to her. Deglutition became increasingly difficult. The attempt to swallow was followed by severe spasms. Her death took place on the 30th.

The treatment was at first chloroform inhalation. But the patient, although apparently relieved, immediately upon regaining consciousness, expressed herself as feeling worse, and after a few trials it was laid aside. Large doses of Dover's powder and calomel were then exhibited, and strong turpentine enemas, with castor oil. During the last night of her life she was directed enemas of tobacco at intervals of six or eight hours; but only one was administered. Her death occurred on the morning of the 30th, less than 48 hours from the commencement of the tetanic symptoms. The patient had not been exposed to cold in any manner; indeed, she had not left her bed since my first visit.

I learned after her death that she had undoubtedly been subjected to an operation for the procurement of abortion a few days previous to my first visit.

The third case occurred in July, 1863. My attendance commenced on the 24th of June. The patient was a woman of good health and habits, a mother of three children, aged about thirty-five. I found her flowing very freely, a condition which had existed for some hours. She was faint, but had slight pain. Cold applications were made, ergot and finally opium and acetate of lead and the tampon of sponge. The abortive process was completed, and I discontinued my attendance on the 29th. The woman I found on that day sitting upon the sofa, and I took my leave with many cautions as to exposure and exertion. Indeed, my advice was that she should remain in bed a fortnight.

Five days after, on the 4th of July, I was again called to this patient. She was in bed complaining of stiffness of the jaws and throat. Tetanic spasms soon followed, opisthotonos, with severe spasms of the limbs at times more severe than at others.

The spasms seemed to be controlled in some measure by the use of belladonna and lobelia in doses short of vomiting. Upon these remedies principal dependence was placed. Beef-tea and wine were exhibited as nourishment. The case resulted fatally on the 12th of July, eight days after the attack began.

Of these cases we may observe, first, that they occurred after abortion, in the early period of pregnancy, and all of them proved fatal. Second, although the first case might be supposed to have been owing to exposure to cold, the reputed cause of "idiopathic tetanus" in general, the second case could not have been so caused, as the patient had not left her bed after treatment for the metritis, to the time of the tetanic attack. Third, with regard to the retention of the secundines. In the first and third cases these had been discharged, while in the second they were retained. Fourth, the abortion was not produced in the first case, while in the second it is probable that it was procured by instrumental means, and in the third case stimulating teas had been freely drank with the design of producing the abortion. Fifth, the disease occurred at very various periods after the phenomena of abortion came on, viz., in the first case in eight days, in the second in four days, and in the third ten days afterwards.

The following points of interest in regard to this disease seem to me, I will not say established, but rendered probable by these cases: That it is more likely to occur after abortion than after confinement at the full term; that it occurs whether the abortion may have been procured or not, and whether or not the secundines be retained; that it may occur and is most likely to occur within ten days of the commencement of the abortive effort. And, finally, that it is very dangerous, and generally fatal.

Upon an examination of those medical periodicals which my own library contains, I find but a single report of a case in this country in the *Ameri-*

can Journal of Medical Sciences, since 1827 to 1860. That case was reported by Dr. Storer, of Boston. It occurred after a confinement at the seventh month, September 20, 1841. The placenta, being adherent by its whole surface, was not discharged. Only three small portions of the size of English walnuts came away on the 26th of September. Tetanic spasms came on September 27th, seven days after the birth of the child, and occasioned death at midnight of the 28th. There were no symptoms of metro-peritonitis, or any unusual symptoms or trouble until the 26th, when the doctor made an attempt to remove the placenta, and administered ergot with only partial success. The doctor seems to attribute the casualty to the retention of the placenta.

The same journal contains a notice of two cases reported to the Obstetrical Society of Edinburgh, in 1850. Both of these cases occurred after abortion; one seven days after the abortive effort commenced, in which death occurred on the third day. The second supervened upon an attack of tonsillitis. Stiffness of the jaws being complained of on the first day, which increased and was followed on the fourth day by tetanic spasms, which occasioned death in the afternoon of the same day. In this case the tonsillitis occurred in consequence of exposure, as was supposed, to cold, upwards of a fortnight after the abortion; and this was at an early period of pregnancy.

At this meeting, Dr. Simpson, of Edinburgh, observed that he had seen a woman die of tetanus after a uterine lesion. "In this case a very large, soft polypus was detached and thrown off by the spontaneous efforts of the uterus. A few days subsequently the patient had difficulty in opening her mouth. She died in course of fifty hours with all the symptoms of general tetanus." The same journal records that "in some of the Registrar-General's Reports two cases of death from tetanus after childbirth are noticed."

The *Medico-Chirurgical Review* notices, in the July number of 1849, the report by Dr. Aubinais, of Nantes, of three cases, two of which occurred after confinement at the full time, and one at seven months. One case resulted *in death* seven days after the tetanic condition came on. "The tetanus in this case seemed to have been induced by exposure to cold; the patient, with high milk fever, got out of bed and walked across a wet floor with bare feet. She was soon seized with shivering, difficult deglutition, and gradually the tetanic condition markedly prevailed."

In the second case, the patient had been bled during an attack of eclampsia. Delivery followed soon after at the seventh month; and on the fifth day, having drank largely of cold water, she was seized with shivering, trismus, and finally complete tetanus This patient recovered under the use of blisters alone, and warm fomentations to restore the lochia. The spasmodic symptoms did not give way for twenty days.

In the third case, the patient, four days after confinement, while in a state of perspiration, exposed herself to wet and cold, suppressing the lochia. The tetanic symptoms occurred twenty-four hours after; became fully developed, and continued, obstinately resisting the most active antiphlogistic treatment, until the tenth day, when they began to give way, and she recovered. She was bled six times, had one hundred leeches applied, and afterwards took musk and valerian.

These nine cases are all which these journals, the *American Journal of the Medical Sciences*, the *Medico-Chirurgical Review*, and *London Lancet*, have reported during the last thirty years. Of these only two occurred after confinement at the full time. The attack occurred within ten days, except in one instance in which a fortnight had elapsed. The disease proved fatal in all except two cases, and one of these, that which followed the eclampsia, might have been more of a simply nervous character. It continued twenty days, and is said to have yielded to blisters and warm baths. The other recovery was after excessive depletion, six venesections, and one hundred leeches.

These results hardly serve to vary the conclusions drawn from my own cases, while they serve to strengthen the point, *that no woman is safe from the attack for at least ten days after the uterine effort, whether in cases of abortion or of child-birth at the full time.*

Art. VII.—*Contributions to Aural Surgery. The Use of the Artificial Membrana Tympani.* By D. B. St. John Roosa, M. D., Aural Surgeon to the New York Eye and Ear Infirmary. Lecturer in the University of the city of New York.

Case I. A farmer, æt. 30, from Michigan (at the Infirmary), January 1865. The patient had scarlet fever thirteen years ago, since which time he has suffered from periodical attacks of pain referred to the ears, discharge of pus from them and vertigo. He has also been so deaf as not to hear ordinary conversation ever since the attack of scarlatina. Patient's general condition is bad, he having suffered much from intermittent fever. Cannot hear a watch, which should be heard by a person with normal hearing power, more than four feet, at all, neither on auricle, mastoid process, nor frontal bone. The right membrana tympani has been wholly removed by ulceration, no trace of *ossicula auditus*. Mucous membrane of the cavity of the tympanum hypertrophied. A portion of the periphery is all that remains of the left membrana tympani. The incus and stapes remain in situ, but the malleus has been lost. Mucous membrane of cavity of the tympanum also hypertrophied. Both Eustachian tubes are pervious, as proven by the Valsalvian experiment. The artificial membrana tympani was placed in the right ear without producing the slightest benefit; being inserted in the left, it immediately so improved the hearing, that the watch could be heard two inches from the auricle, and ordinary conversation several feet. The patient was enabled to pronounce isolated words after a speaker standing more than twelve feet distant. The patient was under observation for a few days, during which time the hearing remained as good as above stated. He then left for his home, taking with him a supply of the artificial membranes.

Case II. Miss U., æt. 30, N. Y., May 31, 1863. Patient has been deaf ever since she can remember. Does not hear conversation unless specially addressed, and then the voice must be raised. She knows no cause for the deafness. Hears the watch two inches from the right auricle, not at all on the left side, except upon the mastoid process. Left membrana tympani opaque in its mucous and fibrous layers. The light spot is lessened in size, and the head of the malleus is abnormally prominent. Right membrana tympani perforated by ulceration in centre, the remaining portion is granulated. A very slight amount of greenish fetid pus is secreted by the cavity of the tympanum and the remains of the drum. The pharynx is congested. Eustachian tubes impervious, as shown by the Valsalvian experiments, Politzer's method, and the catheter. General health not good, although no especial disease is recognized. Patient was seen every few days until August 5th, during which time the following treatment was carried on: Permeability of the Eustachian tubes was secured by the use of the catheter and Politzer's method, together with the use of gargles, and a weak solution of sulphate of zinc (gr. j ad aq. ℥j) was applied to the drum, after daily syringing, in order to check the ulcerative process. When this was restrained, an artificial membrana tympani was applied and worn except at night. It caused at first much irritation and furuncular inflammation. The artificial drum was removed until this was checked. The drum is now worn all day, and the watch is heard from six to eight inches with it, only two without it. Ordinary conversation heard fairly; hearing on the other side as before. Patient expresses herself as being very much improved.

Case III. J. J. V. P., æt. 28, La., Aug. 12, 1865. Three years ago while in the artillery service patient lost his hearing gradually, although he remembers at one particular time after being engaged in heavy firing, that he had a distinct sensation of ringing and fulness in his ears. When a child he had the same sensation in the right ear, after which he was deaf from that ear for some time. The ears were treated by the medical officer of the regiment by the application of tannic acid. He continued in the service until the end of the war, and was subjected to various kinds of treatment, application of arg. nit., cup. sulph. and other astringents. At times he could hear quite well, and then his ears were "stopped up" for a time. He was exposed to much hardship during a great part of his term of service. The deafness has increased until now, when he cannot hear at all from the right ear, and from the left with the aid of an ear trumpet. He does not hear the watch at all on either side. The right membrana tympani, except as to the upper portion, where a small rim remains, has been removed by ulceration. The integument of the auditory canal, and the mucous membrane of the cavity of the tympanum, are hyperæmic and swollen. The little bones of hearing cannot be found. There is a slight amount of fetid pus secreted by the mucous membrane. On the left side the auditory canal is extremely hyperæmic, swollen, and tender. The epidermis is exfoliating. The membrana tympani is not seen, but the Valsalvian experiment shows that it is perforated. Both Eustachian tubes are open.

October 18. Since the first date the patient has been seen twice a week, and has been treated in the following manner. The ears have been gently syringed with warm water twice a day, a weak solution of the sulphate of zinc (gr. ss ad ℥j) has been dropped into the auditory canal and cavity of the tympanum, always warming it before use, and injections of the vapour of iodine have been made into the middle ear, by means of the combination of Politzer's method for rendering pervious the Eustachian tube with an inhaler, described by Dr. Buttles, of this city.[1] (This method of combination is, I believe, original with myself. Buttles' inhaler consists essentially of a hollow bulb of hard rubber with a nozzle. In the cavity of the bulb is placed a small sponge, which is saturated with the tincture of iodine. This bulb is attached to a bit of rubber tubing, and this is in turn placed over the pipe of an ordinary soft rubber globular syringe (Politzer). The nozzle of the inhaler is inserted in one nostril, the other being closed with the finger, the mouth is also shut, and the patient told to swallow (a little water facilitates this); just as the patient is in the act of swallowing, the physician compresses the bulb of the syringe, the Eustachian tubes open, and the air, iodized, passes into the cavity of the tympanum, or, barring a mooted point, into the faucial orifice of the Eustachian tube.)

The condition of the patient's ears is now as follows: On the right side the hyperæmia and swelling are reduced to a minimum, as also on the left. In the left cavity of the tympanum the incus in position can now be distinctly defined. On this side the artificial drum is worn by day, except when the patient is alone for some hours, and removed at night. On the right side the drum has been worn at times, but never with any appreciable change as to the hearing power, which remains as when patient first came under observation, except that he can now hear the alphabet pronounced through an elastic tube.

On the left side he can hear the watch over the auricle, and ordinary conversation near at hand with ease. He can hear a sermon in church, and goes once more into society, from which his previous amount of deafness completely shut him out. He does not now use an ear-trumpet at all, hearing better without the drum than he did formerly with the aid of a conductor of sounds. The patient is extremely intelligent, and to his strict attention to the directions given—his careful use of the artificial drum, removing it whenever it has caused the slightest irritation—a great part of the modicum of success attained is due.

CASE IV. Miss N., æt. 18, July 18, 1865. One year ago was quite ill, the nature of the affection cannot now be accurately ascertained. During the sickness both ears began to discharge pus, and deafness appeared. The discharge was checked, but the deafness has gradually increased until now, when she cannot hear ordinary conversation, and hears the watch only one inch from the auricle. Each membrana tympani has a central perforation, and there is a slight amount of yellow fetid pus secreted in the cavity of the tympanum. The Eustachian tubes are pervious. The artificial drum improves the hearing on each side, by the watch, to a distance of six inches, and renders ordinary conversation easily heard. The patient was directed to daily syringe the ears with tepid water, using afterwards an astringent, and to wear the drum during the day. Patient has come to the office very irregularly, and carried out the directions very inefficiently. She seems to have an aversion to the use of the drums, wishes to be cured without wearing them. They cause very considerable irritation of the auditory canal.

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[1] New York Medical Journal, July, 1865.

Case V. Rachael C., æt. 16, April 1, 1865 (at the Infirmary). One year and a half a ago, patient discovered that she did not hear well. The deafness still continues with some occasional pain and noise in the ears. She can hear the watch three inches from the right ear, one inch from the left. There is a perforation of each drum with a slight ulcerative process going on in the membrane. Patient is of a strumous diathesis, has a curvature of the spine, but is just now in fair general health. Careful syringing of the ears, followed by the use of an astringent, was directed. There is no account of the condition of the Eustachian tubes until *June* 8, when Dr. C. E. Hackley, inserted an artificial membrana tympani and made the following note: "Artificial drum tried on the right side, of which the Eustachian tube is pervious, the hearing distance increased to ten inches. Politzer's method of rendering pervious the tube was practised.

June 22. "Left Eustachian tube is now pervious, with artificial drum, hearing advanced to twelve inches."

Sept. 14. I saw the patient and made the following note: "Patient has been in the country and has worn the artificial drum by day ever since. Hearing distance, right ear twenty inches, left two feet. Drums cause no irritation whatever.

Remarks. Surgical literature, so far as I can find, has comparatively little reference to cases in which the artificial drum has been worn. I have, therefore, given the foregoing somewhat in detail, in order to show about what may be accomplished by the substitute for the natural membrane. The cases have been taken without any particular choice, from a number of which I have notes. It is the habit of the writer to tentatively apply the artificial membrane to all ancient perforations, where the hyperæmia and inflammation or discharge of pus are not very considerable. Recent cases of perforation, as a rule, heal so readily that the use of the drum is not indicated.

In order to a successful use of the artificial membrane—

1. The Eustachian tube must be pervious.
2. The stapes or incus of the ossicula must be *in situ.*
3. The inflammatory action in the external auditory canal and remains of the drum must not be excessive.

It is also of great assistance to the surgeon in procuring a successful wearing of it, that the patient should be intelligent enough to realize that at the best the disk of rubber is a foreign body, which should be carefully removed at any approach of irritation. It is, therefore, not of much use in the case of children, or unusually stupid or careless adults. It should also be stated that cases have been found where all the above-named conditions have been fulfilled, where it was *à priori* supposed that the artificial membrane would do good, and yet repeated trials proved that the use of it effected nothing for the hearing.

In these cases we may perhaps conclude that there existed very considerable rigidity of the quasi articulation of the stapes with the *fenestra ovalis.*

ART. VIII.—*Successful Removal of the Uterus and both Ovaries by Abdominal Section; the Tumour, fibro-cystic, weighing thirty-seven pounds.*[1]

By HORATIO ROBINSON STORER, M. D., of Boston, Assistant in Obstetrics and Medical Jurisprudence in Harvard University, Surgeon to the New England Hospital for Women, and Professor of Obstetrics and the Diseases of Women in Berkshire Medical College.

BUT few of the capital operations of surgery have been attended by so uniformly a fatal result as has been extirpation of the uterus when in its normal position; seven-eighths of the attempts at removal of the organ under these circumstances, prior to 1863, having resulted in death. The voice of the profession, therefore, even of that branch of it more particularly devoted to the treatment of the diseases of women, and accordingly more likely to be sanguine of success, has been almost unanimous in pronouncing the operation unjustifiable. Such has been the verdict in the past, and such is found to be the case even in the present days of legitimatized and frequent abdominal section for ovarian disease. Thus, says Gendrin—

> "It is evident that the extirpation of the uterus is one of the gravest of operations in surgery, since it is the most fatal. We must conclude that in many cases it will be wiser to abstain from the operation."[2]
>
> "We consider extirpation of the uterus, not previously protruded or inverted," wrote the editor of a leading British periodical, "one of the most cruel and unfeasible operations that ever was projected or executed by the head or hand of man. We are very far from discouraging bold or untried operations, but there is a limit beyond which it may not be prudent to go, even should a solitary instance or two of success rise up as precedents to bear out the operator."[3]
>
> "After a careful examination of the results of the operation when the uterus is *in situ*," remarks Churchill, thirty years later, "it is really difficult to find adequate reasons in its favour, except the repugnance which every one must feel to give up entirely the hope of affording relief."[4]

Prof. Simpson, so late as within three years, has used the following language:—

> "Cases have been put upon record where the operation was performed, but with such disastrous results as to hold out no encouragement whatever to its repetition, but rather to serve as a loud warning against it. Judging of it

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[1] An abstract of this paper was communicated to the American Academy of Arts and Sciences, at their meeting of Nov. 14, 1865, in the hope that certain points involved, as the attempt at menstruation in the absence of both uterus and ovaries, might thus be more completely brought to the attention of physiologists and other scientists in medicine, just as its present publication will reach the great body of workers in practice.

[2] Journal Générale de Médecine, Oct. 1829.

[3] London Medico-Chirurgical Review, July, 1825, p. 264.

[4] Diseases of Women, p. 318.

> *a priori*, we should regard the operation as unjustifiable, and experience serves only to confirm the judgment. * * * Even when the disease is confined to the body or fundus. extirpation of the uterus is such a hazardous operation, that I have no hesitation in saying that it should even then be rejected, as an utterly unjustifiable operation in surgery."[1]

The quotations above given are expressions of opinion as to the justifiability of the operation in cases of malignant disease, where, in the presence of intense suffering, and the life of the patient being necessarily in immediate peril in the absence of any such attempt, there is the greatest excuse for its performance.

For the treatment of cancer, methods have frequently been considered legitimate that would be condemned for any other form of disease. Desperate cases have, through their very desperation, nerved both surgeon and patient to measures from which, for other diseases, each would equally have shrunk. If, then, the extirpation of a carcinomatous womb by abdominal section is pronounced unjustifiable by our leading authorities, on the mere ground of its immediate dangers, irrespective of the probably recurrent character of the disease, it is not surprising that the removal of the organ for non-malignant affections should have been, at least as decidedly, considered improper, and we therefore find Graily Hewitt, of London, the last and the best of British systematic writers upon the diseases of women, speaking as follows:—

> "The inconveniences resulting from the presence of tumours of the kind now under consideration (fibrous) are hardly ever sufficiently intense to render justifiable their removal by surgical operation."

And again:—

> "Ordinarily, the effects of the presence of large fibroid tumours of the uterus in the abdomen are not such as to call for or to justify operative measures. In some such cases the abdomen has been opened for their removal, under the impression that the tumour was of ovarian nature, and in some such cases the tumour has been excised, but generally with unfavourable results. Such cases are not fitted for operation."[2]

He speaks of the sole British instance of success, that by Dr. Clay, of Manchester, "whose boldness and success in abdominal operative surgery are unequalled," as "a most remarkable case, an exceptional one in every sense of the word;" and the leading medical journal of London, also in 1863, characterizes the other successful instance of the operation in Europe, that by Koeberlé, as "one of the most extraordinary operations ever undertaken in surgery."[3]

Most of our latest obstetrical authorities omit all mention of the possibility of the removal of the uterus when *in situ*, by their silence expressing the strongest condemnation of its mere idea; while others confine their remarks to those methods of partial procedure, by enucleation, &c. &c., which, in my own hands as in those of others, have proved successful where the uterus could be approached from below, but almost every instance of attempting which by supra-pubic operation has proved fatal.

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[1] Clinical Lectures on Diseases of Women, 1863, p. 65.

[2] The Diagnosis and Treatment of Diseases of Women, 1863, p. 572.

[3] Med. Times and Gazette, 1863, p. 604.

Thus, Dr. West, of London, speaks as follows:—

> "The non-pediculated growths, and those pedunculated tumours which spring from the outer surface of the uterus, are almost or altogether beyond our reach. A few cases are on record in which the abdomen has been laid open, and in which the extirpation of a fibrous tumour from the outer surface of the uterus has been attempted, and even actually accomplished. In all instances but one, which is reported by an American surgeon, Dr. Atlee, its completion was followed by the patient's death. It is a proceeding to be altogether deprecated, difficult to accomplish, almost certainly fatal if concluded, surrounded by dangers which wisdom cannot foresee, nor skill avert."[1]

The above remarks are but an echo of the opinion of Dr. Rigby, expressed the year before, who said that—

> "The position, form, size, and connections of the tumour must be peculiarly favourable to render such an operation possible, and even then it would only be justifiable if accompanied with symptoms of the most urgent character."[2]

While the very last writer of all upon the subject, my friend Prof. Byford, of Chicago, thus summarily disposes of the whole subject:—

> "There remain a large number of uterine tumours that are wholly beyond the reach of the surgeon. I am not aware that any living surgeon advises the removal by surgery of an extra-uterine fibrous tumour, even when we can decide that the pedicle or point of attachment is small."[3]

Under these circumstances it might seem presumptuous for me to claim, as I shall now do, for extirpation of the uterus affected simply with non-malignant disease, its place as a practicable and perfectly legitimate operation in surgery, were I not able to furnish positive evidence of a character to outweigh all merely preconceived opinion, as well as that based upon the result of previous operations, part of which were unfavourable only because they had been more or less carelessly or improperly undertaken or performed.

Quite a number of attempts at extirpation by abdominal section of the uterus enlarged by fibrous outgrowths have of late years been made, some of them successful so far as concerns removal of the tumour, some of them uncompleted, but a large majority of them rapidly proving fatal. It is necessary that this operation should not be confounded with removal of the undisplaced organ by the vagina; nor with its removal when prolapsed; nor with removal of an inverted uterus; nor with amputation of the cervix below the vaginal reflexion; nor with amputation of the cervix above the vaginal reflexion; nor with removal of sessile or pediculated fibroid projections into the uterine cavity; nor with attempts at enucleation, by approach from below, of interstitial uterine tumours; nor with attempts at removal, by approach from below, of extra-mural pediculated or non-pediculated uterine growths; which are all of them very different procedures, and have all of them, with the exception of the first, been attended with a much lower degree of mortality. It should not be confounded, moreover, with three other operations which it might seem to more closely resemble, namely: with the removal, by gastrotomy, of pediculated uterine fibroids; nor with the attempt at enucleation, after gastrotomy, of interstitial uterine growths, allowing the matrix to remain *in situ*;[1] nor with removal of the organ through an abdominal incision, after its attachments had been divided by dissection from the vagina; each of which operations is probably intrinsically more fatal, the latter, indeed, almost necessarily so. Nor should the operation by simple abdominal section be thought so very different from the ordinary operation for extirpation of an ovary, save as concerns the greater difficulty of its performance, the greater courage it requires in the surgeon, and the greater necessity of careful preparatory and after-treatment.

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[1] Lectures on the Diseases of Women, Lond. 1858, p. 308.

[2] Constitutional Treatment of Female Diseases, Lond. 1857, p. 196.

[3] Practice of Medicine and Surgery applied to the Diseases and Accidents incident to Women, 1865, p. 365.

The removal of the uterus by abdominal section, for malignant disease, was proposed by Wrisberg in 1787,[2] and again by Gutberlat in 1814;[3] neither of them, however, seeming to have attempted it in practice. It is said, indeed, to have been performed by Blundell and by other foreign surgeons; but, upon investigation, I find that, with the exception of a single case by the elder Langenbeck, which died soon after the operation,[4] the dissections were made from below; in one or two instances, it is true, there having been also an abdominal section conjoined, through which to steady the organ during the operation, and to remove it, when excised from the vagina. These cases, unless perhaps one of Blundell's, seem to have been uniformly fatal. There are still others, that I find were merely the ordinary ones of inversion or prolapsus, operated upon in the usual manner. One or other of these statements will be found to apply to the famous cases of Sauter, Hunter of Dumbarton, Holscher, Osiander, Delpech, Recamier, Heath, Windsor,[5] Banner, Roux, Lizars, Bramer, Siebold, Dubled, Luytgaerens, Rust, and others. There is still another class of cases, like that of Granville,[1] reported by Lyman[2] as one of fibrous tumour of the uterus, but which, upon examining the authorities referred to by him, I find to have been distinctly ovarian.

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[1] In describing a late case of the kind referred to, Spencer Wells states that he reports it only as "a warning" against the repetition of the operation.

[2] Malgaigne: Operative Surgery.

[3] Siebold's Journal für Geburtshülfe, Nov. 1825, vol. v.

[4] Edinburgh Med. and Surg. Journal, Jan. 1826, p. 242.

[5] Windsor's case is spoken of in the *Boston Medical and Surgical Journal* for July, 1855, p. 445, as one of successful extirpation of the uterus through the abdominal walls; upon examining, however, the tenth volume of the *Transactions of the Medico-Chirurgical Society of London*, in which it was reported, the case proves to have been merely one of inversion removed by ligature from the vagina.

The operations for removal of the uterus by purely abdominal section, for non-malignant disease, have all occurred within comparatively a very recent period. The chances have been considered so great against success, that Dr. Atlee, of Philadelphia, known abroad as the American ovariotomist *par excellence*, and at home as our boldest and most successful operator upon uterine tumours, writes me that he has never attempted extirpation of the uterus, although his "abdominal sections have now numbered 125;" and Professor Meigs, of Philadelphia, whose European reputation as an obstetrician has for many years been greater than that any other American has ever attained, writes me as follows: "I consider you to have been very fortunate to have been able to discharge your patient cured, after so dreadful an operation. Certainly it is one that I could never have been induced to perform."

So far as I can ascertain from careful inquiry, and I have now received many letters upon the subject from leading authorities at home and abroad, there have hitherto been put upon record but five successful cases of extirpation of the uterus by purely abdominal section; one of them British, by Clay of Manchester,[3] one of them French, by Koeberlé of Strasburg,[4] and three American, one of which was by Kimball of Lowell,[5] and the other two by Burnham of the same city,[6] the majority of successful cases thus belonging to American surgery. They were all five, non-malignant tumours.[7] To these cases I now add a sixth from my own practice.

Sarah A. Colcord, of Malden, placed herself under my charge on 25th August, 1865. She is aged 47, unmarried, and has enjoyed good health until, some five years since, she became conscious of the existence of an abdominal tumor. This has steadily enlarged, and in May last she consulted Dr. J. L. Sullivan, of Malden, who diagnosticated the tumor to be uterine and advised against any operation.[1] Miss C. is now larger than a woman at the full term with twins, walks with difficulty, cannot lie down without dyspnœa, is emaciated, very anxious about herself, and desires relief. She is quite deaf. The menses have continued normal up to the present time though always somewhat scanty, and were present a few days since. There has been little or no dysmenorrhœa, certainly nothing like uterine contractions or expulsive pains.

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[1] London Med. Gazette, xxxi., 1843; New Monthly Magazine, Oct. 1827; Lee on Ovarian and Uterine Diseases, p. 86.

[2] History and Statistics of Ovariotomy, 1856, p. 66. The cases quoted by this author from the seventeenth century, by Andreas à Cruce, Carpus, and Zacutus Lusitanus, I find to have been instances of removal of ovaries, or else of the uterus by the vagina, and not by abdominal section.

[3] Transactions of the Obstetrical Society of London, vol. v. 1864, p. 67.

[4] Medical Times and Gazette, February, 1865, p. 209.

[5] Boston Medical and Surgical Journal, May, 1855, p. 249.

[6] Nelson's Northern Lancet, January, 1854; Worcester Journal of Medicine, February, 1854, p. 40; Boston Medical and Surgical Journal, October, 1865, p. 211.

[7] It was Clay's case that persuaded Dr. Simpson to modify the opinion I have quoted from his Clinical Lectures. In January, 1863, he allows that "the case may turn out as a precedent for operative interference in some exceptional cases of large fibroids of the uterus." Transactions of the Obstetrical Society of London, vol. v. 1864, p. 70.

Upon examination, the vagina was found occluded by an extensive hymen and very sensitive, on which account, as well as for greater accuracy in diagnosis, the patient was thoroughly anæsthetized. By external palpation, the whole abdomen was discovered to be filled by a resisting mass, in outline apparently single or mono-cystic, although affording localized fluctuation at many points of its surface, the waves being equable, but neither sharp nor dull—neither distinct nor obscure—evident enough to afford no doubt of the existence of fluid, but yet by no means strikingly decided. The outline of this abdominal tumour was regular and uniform, save in the right iliac region; laterally and inferiorly there was felt a double prominence, more marked upon deep pressure, the two portions distinct from each other, slightly movable, and each giving much the sensation of a small fœtal head. These points were not so marked except under anæsthesia. There was no vascular bruit upon auscultation, nor any sign of ascitic effusion.

By the vagina the cervix was found somewhat hypertrophied, and, so far as could be judged, for the vagina was very narrow and contracted, though not very unusually elongated, the same was true, and to a greater degree, of the body of the uterus. The cervix, as above implied, was somewhat elevated, and external to it there was general resistance, non-fluctuating to pressure upon both walls of the vagina, but nothing decisive as to whether the tumour was uterine or ovarian, nor could additional evidence upon this point be afforded by examination by the rectum. The os was nearly normal in size; the sound entered, not without difficulty, a little more than the normal length, two and a half inches, and the impression was given, after prolonged, careful manipulation, that this only was the extent of the uterine cavity; the negative character of this evidence being explained by the cavity having been encroached upon by the thickening of its walls. The uterus could hardly be moved by the sound, either with or independently of the abdominal mass, which was itself almost immovable. The diagnosis was therefore left undecided—there being present some signs of a multilocular ovarian cyst with an enlarged, but indurated base—while on the other hand the condition of the right iliac region, as examined from the abdomen, was unlike anything I had previously perceived in confirmed ovarian cases. In addition to this, was to be taken into consideration the unusual circumstance, supposing the case to be fibrous and uterine, of the evident, but localized fluctuations detected throughout the greater part of the abdominal mass, and the absence of both menorrhagia and non-periodical hemorrhage.

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[1] Dr. Sullivan writes me as follows: "I expressed to her my conviction that the uterus was the organ primarily affected. I confess that I was then ignorant of the fact that excision of the uterus had been numbered among the triumphs of obstetrical surgery. While a medical student, I had twice witnessed the abdomen laid open from sternum to pubes, and an immense uterine outgrowth removed by separating it from the womb, and ligaturing the bleeding vessels; both patients died within twenty-four hours, from internal hemorrhage. Bearing in mind these cases, and feeling certain in this instance that the uterus was involved in the mischief, I did not regard the case as one suitable for operation, and expressed myself accordingly."

It was clear enough from the examination, the history, and the presence and character of the catamenia, that the tumour was neither an uterus distended by pregnancy, natural or abnormal—whether from hydatiginous degeneration of the chorion, amniotic dropsy, retained placenta or membranes, or a mummified fœtus, nor was it an instance of hæmatometra, whether endo-uterine effusion, or peri-uterine, or pelvic hæmatocele, hydrometra, or physometra.

It was not a case of excessive pelvic cellulitis; nor of abdominal tumour more properly speaking, commencing from a strictly abdominal origin and extending downwards into the pelvis.

There was present no sign of large intra-uterine polypus, pediculated, sessile, or enucleating, nor any of malignant disease, either of ovary or uterus—whether of cervix, body, or fundus.

Under these circumstances, perceiving that the case was an unusual one, I admitted the lady to my private hospital in Boylston Place. Upon the next day I sought the opinion of my father in consultation. After a careful examination, he expressed to me an opinion identical with that I had myself already formed—very guarded and indecisive. I now determined to keep Miss C. under observation for a while, in the city—and this for a twofold purpose, that I might perhaps gain an additional clue to the true character of the case, and that if I decided to operate, the patient might be previously prepared for it by special prophylactic treatment, and by becoming accustomed to the change of local climate and surroundings—each of these being points to which I attach extreme importance in operations about the pelvis. Under appropriate measures a chronic cough which had for some time existed, and which might have occasioned subsequent disturbance was made to disappear, and under the prophylactic treatment alluded to above, the bowels, which had been habitually constipated, became perfectly regular.

After mature reflection I decided to operate, being persuaded that the tumour, whatever its nature, would, unremoved, eventually destroy the patient. I will not say that I was absolutely certain of its character; I have now seen too much of abdominal tumours to believe in absolute certainty of diagnosis in any case, no matter with what care examined. Instances enough are on record, even in these days of anæsthesia and the sound, of the most astonishing disclosures upon an exploratory incision. I have myself seen a celebrated foreign gynæcologist tap a psoas abscess for an ovarian cyst, and have been told by one of our own best ovariotomists that he himself has once performed the section only to find a pregnant uterus. The cases where this organ or the bladder have been punctured by the trocar, where in pseudo-cyesis the abdomen has been opened and no tumour found, and where mesenteric or omental disease has simulated a removable tumour, have been too numerous not to put us on our guard; and it is besides well known that in most of the cases where removal of the uterus has been attempted or effected, the operation was commenced with the intention of removing an ovary. In but a few of these cases has the surgeon approached his task with the conviction or even expectation of finding extensive uterine disease, and under these circumstances performed his operation deliberately and with sang froid. I can only say that I expected to find, as I did find, my case very unlike any that I had ever seen before, and that I never for a moment entertained the thought of not completing the operation after the first incision had been made.

I had retained the patient under observation for a month since the catamenia were last present. They had previously been regular, but a day passed, two, a week, without their reappearance, suppression having undoubtedly been caused by the patient's anxieties. I therefore appointed an hour for the operation, and at the very moment the ether was about being administered, and the patient almost in a frenzy of alarm, the menses suddenly appeared. A week's longer delay, therefore, became advisable.

I have spoken of the patient's alarm. She had at first viewed her prospect as hopeful, but as the day of trial approached, her courage entirely failed, and I was compelled, as I consider it is often our duty in desperate cases to do, to take the sole responsibility of advising the operation and carrying it into effect; herein differing from many of the profession, who make their only standard of necessity the request or the supplications of a patient. This is not the rule in many of the severe operations of general surgery, where the patient places himself, or has been placed, under control, as at an hospital. In my patient's unbounded gratitude, now that she has been saved from the fate that had been impending, I find my sufficient excuse and my reward.

I finally operated on the 23d of September, assisted by Drs. Dix, Langmaid, and Tyng, Dr. Dix kindly taking charge of the etherization; to their skill, courage, and patience, much of my success is undoubtedly due. The temperature of the room was 66° Fahr., as nearly as possible to which standard it was kept during the whole of the after-treatment. The bowels had been moved, and care taken that little or nothing had entered the stomach during the forenoon. Miss C. came readily under the influence of the anæsthetic; the bladder was emptied by catheter, and an incision of five inches made into the abdominal walls from just below the umbilicus downward, keeping within the track of the right rectus muscle. The several layers of integument, fascia, muscular tissue, and peritoneum were carefully divided upon a director, and the tumour exposed, almost completely filling the cavity of the abdomen. Its colour was of a very dark purplish, and the omentum was adherent to the greater portion of its circumference. The presence of these adhesions, and of still others at the sides of the mass was ascertained while the opening was still but slight, by the introduction of a sound. The omentum was highly vascular, some of the vessels being of very great size, resembling in this respect, and in appearance, those of the placenta, and directly communicable with the substance of the tumour. Some few of them were ligated by wire before division, and others divided *en masse* by scissors and afterwards secured by wire ligatures and torsion. Upon the left of the abdominal tumour and deep down there were other extensive adhesions to the peritoneum, which were partly broken down and partly severed. The mass was now found continuous with another also of large size, and of very irregular outline, completely filling the cavity of the pelvis. To manipulate the latter while the abdominal portion was still attached proving very difficult from its weight, their separation was effected by the ecraseur, merely for convenience' sake, and the external opening enlarged by half an inch, to allow extraction. The pelvic mass was found largely attached laterally, the morbid adhesions being chiefly to the left, very firm and vascular. It was lifted up with great difficulty sufficiently to allow a clamp to be passed beneath it; this protected the vaginal septum from being opened, the broadened cervix was after much taxis got wholly within its grasp, and the instrument fastened tightly. Excision was then accomplished by the ecraseur, with the result, so firm were the tissues and so little the spare room, of opening up the jaws of the clamp throughout nearly the whole of its extent, so that it fell from the stump the moment the tumour was cut away. It was now evident enough that the division had been of uterine tissue, though to what extent it was impossible to ascertain without dissection of the tumour. Upon some six additional open vessels wire ligatures were placed, several more were twisted, and the operation was practically completed. So free, however, was the oozing from the extensive surfaces of adhesion that an attempt was made, at Dr. Langmaid's suggestion, to check it by the application of alcohol, but it proved insufficient. I feared that the ordinary styptics, like the actual cautery, might produce a slough, and therefore determined to try the effect of long exposure to air. No less than three hours were allowed to elapse from the commencement of the operation before the external wound was closed. During this period it became necessary repeatedly to empty the cavity of the pelvis of the blood that had collected. I endeavoured at first to do this by suction through a syringe, but its canal soon became clogged by coagula. A silver spoon was for a while substituted, but it finally became necessary to fall back upon sponges, which I had hoped to avoid, because they are thought by many to have an especially irritative and detrimental action upon the tissues of the pelvis. It will be seen, however, that no such injurious effect ensued. The incision was closed by the insertion of five wire sutures, passing through the peritoneum. No superficial sutures were employed, nor was adhesive plaster, or any other dressing, resorted to throughout the whole after-treatment, the abdominal integument being allowed to remain perfectly nude, only being protected from the bed-clothes by an appropriate wooden frame.

During the operation, the pulse had several times flagged somewhat, but the ether was continuously administered to the extent of two and a half pounds.

A few drachms of brandy and water were now cautiously administered, and henceforth, with the exception of a pretty full diet, and the constant employment of quinia and the muriate of iron, the treatment was strictly expectant. The diet was, for the first day, nothing but ice; for a day or two subsequently, flour porridge with milk, or milk gruel, repeatedly given. From this point, greater latitude was allowed; twenty-four pounds of beef being consumed during the first month. From the outset the pulse hardly exceeded 100. There was no nausea or vomiting, but very little pain, but little flatulence, and scarcely any jactitation. Sleep was easily insured by the application of a wet compress over the eyes. The water was constantly drawn by catheter until the third week, to prevent any effort on the part of the patient, and on the fourth day, a suppository of half a grain of morphia was introduced into the rectum to prevent pain and to insure its quiet. The bowels were moved by an enema on the sixteenth day, and of themselves naturally on the eighteenth. For ten days after the operation, no motion whatever of the body was permitted; in spite of all the care that was taken, the urine was so freely secreted that the bladder overflowed itself several times, and in consequence, the sacrum thus becoming wet, I discovered on the eleventh day a slight slough in this region, which was at once and with surprising rapidity healed by Brown-Sequard's and Chapman's alternate applications of heat and cold. Upon the third day, it was evident that adhesion of the lips of the abdominal wound had completely taken place; there had never been any gaping of it from the very beginning; on the tenth day the wires were untwisted, and on the thirteenth and fourteenth they were removed.

The convalescence was uninterrupted. On the fifth day Miss C. begged to be allowed to sit up. On the twenty-first she did so for the first time. On the twenty-eighth she was out of bed, and on the thirty-seventh she returned home to Malden.

Having an operation to perform in the neighbourhood, I called at her house ten days after, on the 9th of November, with Dr. Brown, of Stoneham, and found her perfectly well, getting upon and off the bed without assistance, walking about the house with comfort, and very happy. She had apparently gained many pounds in flesh. I now made the first vaginal examination since the operation, and found the cervix reduced to a mere nodule, button-shaped, and very much smaller than I expected to find; the explanation being, that upon lifting the heavy pelvic mass sufficiently to put on the clamp and ecraseur, the cervix had been so stretched upwards as to make the excision encroach much lower upon its substance than would otherwise have been possible.

From the date of the operation until October 11th, eighteen days subsequently, and twenty-six days after the last appearance of the catamenia, there was no discharge whatever from the vagina. There now occurred a sanguineous effusion, attended by feelings of lassitude, backache, etc. etc., lasting thirty hours, and being an evident attempt at the re-establishment of menstruation; a very curious circumstance, and of great physiological interest, when it is recollected that the uterus and both ovaries had been removed. The ensuing period has been passed without its recurrence.

The case above reported seems to have been one of the so-called fibrocystic disease of the uterus, which has been described by West,[1] Kiwisch,[2] Paget,[3] and others. There is a difference of opinion as to whether the softened portions result, as seems to have been the case in the present instance, from the softening, breaking down, or degeneration of fibrous tumours occupying the abdomen, and therefore subject to less pressure than when in the pelvis, or whether the disease is entirely distinct and separate in character from ordinary fibrous tumour. Fibro-cystic disease is considered by obstetric writers, wrongly, I think, to be exceedingly rare. Graily Hewitt, for instance, in his recent work, says:—

"These cases are very rare, and it seems almost impossible to say how they are to be distinguished from cases of ovarian tumour during life, the physical signs and the symptoms so closely resembling those observed where composite tumours of the ovary are present."[4] And again, the disease "is so rare, that we cannot expect to be able at present to lay down general rules as to the treatment. It has never, so far as I am aware, been diagnosticated during life."[5]

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[1] Lectures on Diseases of Women, London, 1858, p. 268.

[2] Klinische Vortrage, vol. i. p. 455.

[3] Lectures on Surgical Pathology, ii. p. 138.

[4] Diseases of Women, 1863, p. 403.

[5] Ibid., p. 575.

It was evidently present in Parkman's fatal case, to which I shall hereafter refer, in Sands', and in Buckingham's; in Peaslee's, the fluctuation was thought to be occasioned by dilatation of the uterine sinuses.

By the kindness of Prof. Calvin Ellis, to whom the tumour was submitted for examination, I am enabled to subjoin a careful scientific description. The tumour weighed in all thirty-seven pounds; the pelvic mass weighing eight, and the abdominal sixteen, after thirteen pints of fluid had been carefully drawn from it. It was exhibited to the Suffolk District Medical Society, on Sept. 30th, by Prof. J. B. S. Jackson, and its character and relations demonstrated. It is now in the museum of the Medical College.

"The mass of solid tumours was so irregular that it resembled no organ, but the presence of two well-marked ovaries with the corresponding Fallopian tubes, made it evident that a large part of the uterus had been removed, so deformed by the new growth, as to render it unrecognizable except by its appendages.

"In the right ovary was a recent corpus luteum and several smaller cysts. One of the latter contained blood, another a whitish fluid.

"On making an incision at the point where the mass was separated from the subjacent organ, a narrow cavity was opened about four inches in length, lined with mucous membrane, and smeared with bloody fluid. The lower part had a somewhat rugous appearance. A probe passed through one of the Fallopian tubes, and entered its upper extremity. It was evidently the cavity of the uterus itself lengthened and distorted by the new growths, mingled with which was more or less of the uterine tissue. There were about forty tumours ranging from two or three lines to perhaps four inches in diameter. They presented the usual appearance of fibroid growths of the uterus, though a number of considerable size were so filled with calcareous matter as to render the saw necessary for their division. Some were markedly pediculated.

"The large fluctuating mass attached to the broad ligament consisted of two principal tumours with others of smaller size springing from them, and many of them pediculated. They were externally quite vascular, like those connected with the uterus.

"All were of a fibrous character. The fluctuation was owing to two causes, serous infiltration and cystic formations. Some portions had an almost gelatinous appearance, owing to the amount of infiltration, and many others contained irregular cavities filled with clear serum, bloody fluid, or perhaps blood. Though apparently formed by the separation of the fibres of which the masses were composed, some of the cavities had smooth lining membranes closely resembling those of ordinary cysts.

"The above change was similar to that sometimes seen in well-marked fibrous tumours of the uterus, and this may have had such an origin, but it is more probable that it belonged to the broad ligament.

"This was the opinion of Dr. J. B. S. Jackson, who has a specimen showing a true fibrous tumour in the broad ligament."

It will be perceived that in operating upon the above case, I ventured to take just the opposite course to that lately laid down by an eminent operator, Spencer Wells, of London, as the rule to be pursued in fibrocystic uterine disease.

> "If the operation has been commenced," he says, "and the dark aspect of the tumour is observed, it would certainly be advisable not to do more than tap one or more of the largest cysts before examining attentively the connections between the uterus and the tumour. If these should prove to be very intimate, it will be the unpleasant duty of the surgeon to desist from any attempt to do more, and to close the wound as soon as possible."[1]

And I ventured to disregard the opinion of another noted London surgeon, Mr. Jonathan Hutchinson. In speaking of a case where "the tumour is an enormous one, reaching higher than the umbilicus, and distending the abdomen as if in the last week of pregnancy," the general health of the patient remaining tolerably good, Mr. Hutchinson remarks that "it would of course under any such circumstances be madness to think of attempting any surgical treatment."[2]

A hospital surgeon has since asked me if, before operating, I had any expectation of the disease which in reality presented itself, and if I ought not to attribute the woman's recovery wholly to chance. To the first of these questions I have endeavoured already to answer in speaking of the difficulty of an exact differential diagnosis in this case, and of the course we so deliberately pursued. By the other I am reminded of a similar question put to me by another hospital attendant, some ten years ago. I had reported to one of our medical societies (the Suffolk District) a case of advanced carcinoma uteri, where, all other hæmostatics failing, I had controlled hemorrhage and prolonged life for many months by the free use of the actual cautery, an agent which so many of us have seen in daily use in Europe, and which, for one, I have constantly resorted to since the time referred to. At that time, however, it was considered too heroic practice for Boston, and the gentleman to whom I have alluded innocently asked if the case was reported as one of escape from accidentally perforating the peritoneum by the instrument employed.

I do not believe that my success in the present operation was wholly owing to chance, for there were certain elements involved which I am accustomed to value. Had the patient died, I might have been blamed for wilfully incurring the risks I have already shown to be generally thought inevitable for extirpation of the uterus when *in situ*. On the other hand, some of these risks, provided we properly understand them, are, to a great extent, within our control.

But first let me state briefly the statistics, so far as they are accessible, of the operations hitherto performed.[3] I have to return my thanks to

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[1] Diseases of the Ovaries, London, 1865, vol. i. p. 362.

[2] Report on the Enucleative Treatment of Uterine Fibrous Tumours, Medical Times and Gazette, 1857, p. 170.

[3] Spencer Wells' Uterine Cases, so unsuccessful, just published in the first volume of his work on *Diseases of the Ovaries*, were, with a single exception hereafter tabulated, merely removal of outgrowths by excision or enucleation, and not of the uterus itself.

Drs. Clay, Kimball, Burnham, and Buckingham for unpublished information concerning their cases.

	Operations.	Deaths.
Clay[1]	3	2
Heath[2]	1	1
Burnham[3]	9	7
Kimball[4]	3	2
Parkman[5]	1	1
Peaslee[6]	1	1
Koeberle[7]	1	0
Baker Brown[8]	1	1
Wells[9]	1	1
Sands[10]	1	1
Buckingham[11]	1	1
Storer	1	0
	24	18

Percentage of recoveries 1 in 4, or 25 per cent.

I also append the causes of death, so far as I have been able to ascertain them.

	Fatal Cases.	CAUSES OF DEATH.				
		Shock.	Hemorrhage.		Inflammation.	Accident.
			Primary.	Secondary.		
Clay,	2	. . . .	1 (2 hours)	. . . .	. . . .	1 (13th day)
Heath,	1	1 (17 hours)				
Burnham,	7	3 { 1st day 1st day 2d day }	. . . .	. . . .	4 { 3d day 4th day 4th day 5th day }	
Kimball,	2	. . . .	. . . .	1 (3d day)	1 (10th day)	
Parkman,	1	. . . .	. . . .	1 (12 hours)		
Peaslee,	1	. . . .	. . . .	. . . .	1 (8th day)	
Baker Brown,	1	. . . .	. . . .	1 (2d day)		
Wells,	1	1 (4th day)				
Sands,	1		1			
Buckingham,	1	1 (1st day)				
	18	6	2	3	6	1

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[1] Transactions of Obstetrical Society of London, vol. v., 1864, p. 66.

[2] London Med. Gazette; Boston Med. and Surg. Journ., Jan. 1844, p. 494.

[3] Nelson's Northern Lancet, Jan. 1854; Boston Med. and Surg. Journal, Oct. 1865, p. 214, and MS. letter.

[4] Boston Med. and Surg. Journ., May, 1855, p. 249.

[5] Am. Journ. Med. Sciences, April, 1848.

[6] Ibid., Jan. 1856.

[7] Med. Times and Gazette, Feb. 1865. This is spoken of as Koeberle's sixth case, but it is merely the sixth of his abdominal sections, and apparently his only case of extirpation of the uterus. He has lately published a work on the removal of fibrous tumours of the uterus, which as yet I have been unable to obtain.

[8] Transactions of the Obstetrical Society of London, vol. vi., 1865; Am. Journ. of the Med. Sciences, Oct. 1865, p. 484.

[9] Diseases of the Ovaries, vol. i. p. 350.

[10] New York Medical Journal, Dec. 1865, p. 188.

[11] Operation performed at City Hospital of Boston. Case as yet unpublished.

Or, to present these causes more minutely :—

	Causes of Death.	Ultimate Cause.
1. Clay,	Hemorrhage, in 2 hours.	Divided by knife, not by ecraseur.
2. "	Accident, 13th day.	Dropped upon floor by the nurse.
3. Heath,	Shock, in 17 hours.	Divided by knife, not by ecraseur.
4. Burnham,	" in 1 hour.	Operation long delayed.
5. "	" in 4 hours.	" " "
6. "	" 2d day.	" " "
7. "	Peritonitis, 3d day.	" " "
8. "	" 4th day.	" " "
9. "	" "	" " "
10. "	" 5th day.	" " "
11. Kimball,	Slipping of ligature and hemorrhage, on 3d day.	Divided by knife, not by ecraseur.
12. "	Inflammation, on 10th day.	No apparent prophylaxis.
13. Parkman,	Slipping of ligature and hemorrhage, in 12 hours.	Divided by knife, not by ecraseur.
14. Peaslee,	Peritonitis, on 8th day.	Long incision. Strangulation of intestine, protrusion between the sutures, and gangrene.
15. Baker Brown,	Slipping of ligature and hemorrhage, on 2d day.	Divided by knife, not by ecraseur.
16. Wells,	Shock, on 4th day.	Ecraseur bent, clamp broke, and "copious hemorrhage from very large vessels."
17. Sands,	Hemorrhage, immediately.	Divided by knife, not by ecraseur.
18. Buckingham,	Shock, on 1st day.	" " "

In several of the above cases, moreover, chloroform was given, which, for the ordinary purposes of surgery, while it lessens or annuls the shock from pain, is, of itself, undoubtedly attended by a certain amount of depressing action of which sulphuric ether is innocent. In allowing this fact, I make no recantation of my well-known preference for chloroform in midwifery; for I still believe that it is here, when properly exhibited, far superior to ether and perfectly safe, for reasons that I stated in my communication to the Massachusetts Medical Society at its annual meeting in 1863.[1]

It will be perceived from the above statement of the causation of the fatal cases, that in all of them the fatal result might apparently have been prevented. In some of these operations, the uterine character of the disease has hardly been suspected until the abdomen had been opened; in others, its completion was rendered necessary from hemorrhage consequent upon an attempt at paracentesis. Compulsory operations, or those that originally are unintended by the surgeon, are seldom performed as calmly or carefully as those to which he has made up his mind.

The dates at which the operations, successful and unsuccessful, were performed are as follows :—

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[1] Boston Med. and Surg. Journ., Oct. 1863, p. 249. Eutokia, The Employment of Anæsthetics in Childbirth, Boston, 1863.

1.	Clay,	Aug. 1843.	Fatal.
2.	Heath,	Nov. "	"
3.	Clay,	Jan. 1844.	"
4.	Parkman,	" 1848.	"
5.	Burnham,	June, 1853.	Successful.
6.	Kimball,	Sept. "	"
7.	Peaslee,	" "	Fatal.
8.	Kimball,	Date not given, but prior to 1863.	"
9.	"	" " " "	"
10.	Burnham,	" " " "	"
11.	"	" " " "	"
12.	"	" " " "	"
13.	"	" " " "	"
14.	"	" " " "	"
15.	"	" " " "	"
16.	"	" " " "	"
17.	Wells,	Oct. 1861.	"
18.	Clay,	Jan. 1863.	Successful.
19.	Koeberle,	April, "	"
20.	Baker Brown,	1864.	Fatal.
21.	Burnham,	Sept. 1864.	Successful.
22.	Sands,	June, 1865.	Fatal.
23.	Buckingham,	" "	"
24.	Storer,	Sept. "	Successful.

From the above it appears that, prior to 1863, there had been 17 operations and 15 deaths, the mortality being 88 per cent.; whereas, at the present date, there have been 24 operations and but 18 deaths, the mortality being reduced to 75 per cent. It must not be forgotten that, of the last seven operations, four, or 57 per cent., have been successful.[1]

The dates of the successful operations are as follows:—

1. Burnham . . .	June, 1853.	4. Koeberle	April, 1863.
2. Kimball	Sept. "	5. Burnham . . .	Sept. 1864.
3. Clay	Jan. 1863.	6. Storer	" 1865.

Four out of the six, or two-thirds of the successful operations are American, and of these four, all of them have been performed in New England—one in Connecticut, one in Rhode Island, and two in Massachusetts.

The size of the mass removed in the successful cases is as follows:—

Burnham	8 and 16 pounds.
Kimball	"Not exceeding 10 pounds."[2]
Clay	11 pounds.
Koeberle	Not stated, but apparently not very large.
Storer	37 pounds.

It would have seemed, from the earliest of the above statistics, that the operation ought hardly to be approved, were it not remembered that the disease, if left to itself, usually sooner or later proves fatal. Even Burnham, who, by reporting two cases of success, has taken the lead in this direction, seems to have become discouraged by his own large percentage of mortality.

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[1] Reliance must never be placed on statistics based promiscuously on varying methods of practice. It is the result under the best treatment that should settle the question of an operation.

[2] MS. Letter.

In reporting his first case, which was published as the "removal of an *ovarian* tumour," he had remarked: "Although this case terminated favourably, I would not easily be induced to make another attempt to extirpate the uterus and ovaries, or even to remove the uterus under almost any condition; and the operation should never be attempted without due consideration of the consequences of submitting a patient to such formidable risk."[1] In his subsequent publication, some six weeks ago, he says:—

> "I have declined, for a number of years, to operate on fibrous tumours, except in a single case. In my first operations I attempted to remove these, but generally gave them up, after exploring the parts, as too dangerous to complete. I cannot now recommend the removal of fibrous enlargements of the uterus, and all the cases I have seen involve the uterus in their growth."[2]

> "It may be remarked," Dr. Burnham writes to me, "that all my cases were undertaken as a *dernier resort*, and in general all the patients were much reduced by long suffering and impairment of vital function, to which cause I think that the great mortality attending this class of operations may be attributed."

I hope now to show that other dangers, as well as that here referred to, are in great measure and generally within our control, and that the proceeding thought necessary in many other cases, as in that of Dr. Deane, of Greenfield,[3] and in four communicated to me by Dr. Burnham from his own practice, where the operation begun has been desisted from, through a belief in its impracticability, may hereafter be avoided. The mere fact that patients generally recover after such exploratory incisions is of little satisfaction, provided the disease itself still remains.[4]

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[1] Worcester Journal of Medicine, Feb. 1854, p. 47.

[2] Boston Medical and Surgical Journal, October, 1865, p. 214.

[3] Boston Medical and Surgical Journal, 1848, vol. xxxix. p. 221.

[4] With regard generally to a more frequent resort to exploratory incisions than now generally obtains, I cannot express myself too favourably, and I believe that upon this point I express the opinion of the best ovariotomists. There are some pressing cases, where it is absolutely impossible to be positively certain as to the existence of a tumour, let alone its differential diagnosis, even if anæsthesia has been employed. The fact that, upon incision, no tumour has been found in some such cases, has been made altogether too much of as an argument against section. As well might it be said that the cavity of the uterus is never to be explored by sponge tents, because in many cases of uterine hemorrhage where they have been employed, only negative evidence has been attained. Exploratory incisions, just as with operations for hernia, are attended with but little danger; they heal readily except where ascites is present, and even here much more frequently than would be expected. They might in many instances indicate the existence of curable diseases, where the patient must otherwise, for want of an exact diagnosis, in no other way possible, be allowed to die. In performing the section, for exploration or for removals, I differ from most operators, in that I prefer making it in the track of a rectus muscle rather than in the linea alba, being thus much more certain, from the nature of the tissue divided, of a primary reunion.

"The dangers attendant upon the removal of so important an organ as the uterus," says Churchill, "are the following, and they cannot be *lightly* estimated :—

"1. The first danger is from the shock given to the constitution, which may even prove fatal. Dr. Blundell thinks that this is felt the most when the supports of the uterus are divided, and when the mass is extracted from the pelvis. The shock, so severe when the uterus is *in situ*, is very slight when the uterus has been displaced by inversion.

"2. Dangerous or fatal hemorrhage may occur after the extirpation of the uterus *in situ*," and may be primary or secondary.

"3. The parts within the pelvis or the peritoneum may be attacked by inflammation, compromising the life of the patient."[1]

That is to say, the dangers are chiefly from pure nervous shock; hemorrhage, immediate or secondary, from the slipping of a ligature or ulcerative opening of vessels; excessive reaction, or inflammation subsequently lighted up, generally by appreciable causes.

Can any of these sources of danger be counteracted, or, what is far better, averted?—for here, as everywhere in our art, the prevention of evil is far better than its cure. I think I can show that each of the elements referred to may be guarded against.

I. The shock of any severe or capital operation, and pelvic operations are particularly severe in proportion to their extent, is seldom uncomplicated; making, of course, due allowance for the general constitutional condition of the patient previous to the operation, it is generally found owing to several causes.

The causes referred to are the following—producing alone, or in combination with each other, an impression, direct or by reflexion, upon the cerebro-spinal system, by which its action is for the moment or permanently paralyzed; death occurring, where the case proves fatal and there still remains a sufficiency of blood for the heart to propel, from asthenia, the heart ceasing to act for want of power :—

1. Excessive pain, perhaps accompanied by
2. Excessive fear or anxiety.
3. Hemorrhage, not necessarily, however, excessive.
4. Injury to a nerve or nerves, as by division or inclusion in a ligature, and probably in proportion to the suddenness or rapidity of its infliction.
5. The removal of abnormal pressure upon nerve or nerves, or upon nerve-substance, whether by solid or by fluid pressure, as by excited or excessive vascularity, and, also, probably in proportion to the rapidity of such removal.
6. And we add, also, to these, as a predisposing cause, the existence of a previous low degree of general vitality, whether as anæmia or toxæmia.

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[1] Diseases of Women, p. 318.

Now each and every one of these elements of danger may be provided against beforehand.

In the first place, the necessity of endeavouring to correct or to improve an impoverished or poisoned condition of the blood, so far as possible and wherever possible, before subjecting any patient to the dangers of a capital operation, it would seem, must be recognized by every surgeon. Would that it always were!

Secondly. The action, at times so evident and so deadly, of pain and of present dread or alarm may, also, be always counteracted. Would, again, that they always were!—for here, also, might the ratios of mortality be lessened. Under anæsthesia, pain and fear are alike placed in abeyance. The patient falls asleep in hope, and wakes in joy at its fulfilment. There seems, moreover, a direct supporting effect upon the nervous system from the anæsthetic—by which I mean sulphuric ether, and for every operation save the conduct of childbed, as I have already stated, where I believe chloroform to be specially indicated. It is, of course, to be presumed that the agent is pure and is properly administered, under which conditions it would seem that the nervous system does in reality become peculiarly tolerant of shock.

Thirdly. Hemorrhage, necessarily so profuse in former days when the knife alone could be employed, is reduced to a minimum by the use of the ecraseur. Ligature of a cervix stump, just as that of an ovarian pedicle, no matter how skilfully or tightly adjusted, can by no means insure against an alarming loss of blood at or immediately after excision. Its employment affords no guarantee against the reopening of a bleeding orifice by the knot slipping, or by its cutting by ulceration into a vascular canal. These risks, thanks to Chassaignac and to the great Scotch champion of hæmostasis by pressure, whether by needle or metallic ligature, may now every one of them be escaped.

Fourthly. The possibility and the advantage of slowly separating the organic connections of a tumour have to a certain extent, though but to a certain extent, been already recognized in surgery. In the case of intrauterine and vaginal polypi, of inversion and the like, the ligature has been mainly preferred to the knife; the chief advantage claimed for the latter being, that where the sources of its consequent hemorrhage could readily be reached, the risks dependent upon purulent and septic discharges, liable by absorption to produce pyæmia, from an ulcerating ligature, were avoided. Now, with the ecraseur we can destroy continuity as slowly as we please, consistently with a reasonable submittal of our patient to other sources of danger—as, for instance, to prolonged exposure of the peritoneal membrane to the air and other external agencies. Upon this point I cannot help differing from my esteemed and eminent friend, Dr. Walter Channing, who, from having seen it used in my own hands for dividing a broad ovarian pedicle, has incontinently condemned the ecraseur for any purpose whatever,[1] and without any personal experience of his own.

In the case referred to, the fatal result from peritonitis on the fifth day was clearly owing to my having listened to the advice of others, contrary to my own convictions, and having used silk ligatures brought out externally, instead of, as here, metallic ones dropped into the pelvis, and there left *in situ*.

By slowly tightening the chain of the ecraseur, we not only lessen the chances of hemorrhage, by rendering the wound more of a contused than an incised one, we not only gradually divide any nerve-fibres that may be included, and gradually interrupt the to-and-fro nerve-currents that are in transmission, but we as gradually interrupt the current of the arterial circulation, and prevent any sudden backward pressure of the fluid column upon the heart—a pressure that must be present in every case of sudden interruption of the circulation, more especially from laceration or contusion, where hemorrhage does not occur, and that is evidenced, grossly, by the click heard, the bursting sometimes seen, of service-pipes in which the current of water is suddenly checked. The elasticity of the arterial walls is not sufficient wholly to neutralize this action, and its occurrence must certainly tend to increase the dangers from shock.

Fifthly, and finally. I am not sure that it may not be good practice to allow the tumour, detached, to remain for a moment or two *in situ*, as was done accidentally in the case now reported. The mass was so heavy, much more so than would have been anticipated from its size, that I remained under the impression that division had not been effected after the loop of the ecraseur had entirely passed through its groove, and the screw was turned until the chain was snapped at its distal extremity. The tumour was then removed, but its pressure was not taken from the surrounding tissues until some little time after all organic connection with them had been severed.

So much, then, for the first of these possible prophylactics of danger in uterine extirpation, when *in situ*, as arising from shock.

II. As an incidental element in the production of shock, I have already considered some of the features of hemorrhage, as controllable by anticipation. There are others. Not merely may the chance of hemorrhage during the operation, or of non-puerperal flooding, as it might justly be called, be prevented, but its recurrence at a subsequent period, where, the abdomen being closed, and its whole extent taking the place of the absent uterine cavity, the risks of concealed hemorrhage become so fearful. I need merely refer to the magnificent work upon acupressure just published by Prof. Simpson, the last, the boldest, and the best of his contributions to science and practical art, if this may be said of suggestions and discoveries "each of which were worth a lifetime to have made;"[1] its perusal will convince the most skeptical, of what every man must acknowledge who tests the question in practice, that a safer way of preventing hemorrhage than by silk or organic ligature is by metallic pressure, just as metallic sutures are more efficient than the others in insuring the great end of all surgery, a union by first intention.

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[1] Boston Medical and Surgical Journal, January, 1865, p. 494.

III. The third of the dangers so tersely enumerated by Churchill is that from inflammation, and this, it will be found, may be as easily guarded against as those already considered.

A certain proportion of the cases of uterine extirpation have died during the first reaction, and in consequence of its severity; another class from subsequent excitement or depression of the circulation generally, from whatever cause; and still a third, from a local excess of circulatory action or local inflammation, also established by a variety of causes. Clay has attempted to reduce these risks, similarly obtaining in ovariotomy, to a formula, by recognizing the existence of critical days. Thus he says, when speaking generally of abdominal sections, of which he has now made no less than one hundred and sixteen—

> "If the patient does not sink immediately from shock, that is, within the first twenty-four hours after operation, the first critical day will be the third, and the cause of fatality, if the case so terminates, will be unsubdued inflammation. The next critical period is the sixth day, when I first apprehend danger after the subsidence of peritoneal inflammation, in the elder class of females particularly, from prostration; should, however, the case be young, this termination may be deferred to the ninth, or next critical day, which is the usual period of prostration for younger females. If the patient passes this point, it assumes a far more favourable prospect for recovery, and the critical days become of less consequence; nevertheless, I have seen the twelfth usher in some very troublesome symptoms, consequent on the loosening or entirely throwing off the ligatures, and in one or two cases I have seen about this period a secondary attack of peritoneal inflammation, which, if not actively and carefully managed, or foreseen and prevented, may wreck the patient."[2]

"If not foreseen and prevented," says this great authority. The words are well worth remembering. The preparation of the patient for the operation, by a previous careful course of medical treatment, is, says the same writer, "of immense importance, and will greatly facilitate the movements of the operator when called upon."[3]

This preliminary or prophylactic preparation is of a threefold character: To raise the general tone of the system; to prevent any tendency to toxæmia, or to counteract such if already present; and, while removing any source of irritation from the digestive organs, to procure a condition therein of healthy quiet. The first and second of these indications I find to be best fulfilled by the use of the muriate of iron, given not merely as a tonic, but, as has been shown by Simpson in his admirable essays upon the identity of puerperal and surgical fever,[1] as a special depurant. The third indication is met, better perhaps than in any other mode, by the exhibition of ox-gall, which not only removes by its solvent action any scybalous masses, even if adherent to the intestinal coat, and prevents flatus, so often initiative of a peritonitic attack, but seems in cases of hepatic disease, functional or organic, to take the place, in some respects, of the natural secretion. The advantage of the ox-gall treatment preliminarily to any severe pelvic operations has been often insisted upon by Dr. Clay. I have myself more than once called the attention of the profession to its advantages,[2] and have long been in the habit of resorting to it in practice. In addition to the other good effects from it, I am inclined to think that under the previous use of ox-gall the intestines are less likely to escape or to force themselves through an abdominal incision.

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[1] Simpson's Obstetric Works, Preface to American edition.

[2] Transactions of the Obstetrical Society of London, vol. v., 1864, p. 63.

[3] Handbook of Obstetric Surgery, 1856, p. 176. The same necessity has been insisted upon by Dr. Clay in almost every one of his numerous papers upon abdominal section.

I have implied that some of the various secondary causes liable to excite inflammation may be prevented. Such is, for instance, the neglect to which I have just referred, of procuring a thoroughly soluble and healthy condition of the bowels prior to the operation. It is on many accounts advisable, indeed necessary, to prevent any peristaltic action of the intestines for many days. If they contain excreta, particularly if these are ancient, their passage may be accompanied by imminent risk; if, on the other hand, such are still longer retained under the use of opium, equal or greater dangers may occur. The processes of decomposition, in abeyance while the pelvic circulation was as yet uninterfered with, may suddenly be set up, and every morsel of feces act as a nidus of destructive or toxæmic force. One need only read the records of cases that have been reported, to be convinced that just upon these points has life depended, and that from their neglect more than one of the successful cases came very near being fatal. Take, for instance, Burnham's first, where the condition of the patient for some days subsequent to the operation was truly terrible. Here, on the third day, there was "uneasiness of the bowels;" on the sixth they were so "distended as to tear open the adhesions, which had been firm for three days, suppuration being abundant and offensive from the wound and vagina." On the seventh day "all the symptoms indicated rapid dissolution." On the eighth day "the patient had a copious evacuation of dark, impacted scybala, which must have remained in the intestinal canal for many days, notwithstanding there had been what seemed to be free evacuations from the entire extent of the canal several times since the operation;" these discharges being of themselves to be deprecated immediately after so severe a shock. "Much prostration attended the evacuations, the patient being kept from sinking only by the free use of stimulants."[1]

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[1] Clinical Lectures on Diseases of Women, p. 176.

[2] As, for instance, in my paper upon the Surgical Treatment of Amenorrhœa, Amer. Journ. of the Med. Sci., Jan. 1864.

The bladder must, of course, be kept constantly voided, and for many days artificially. There is a diversity of opinion as to whether a self-retaining catheter, as that of Sims, or the frequent introduction of the ordinary form, is best.[2] When the flow of urine becomes more than usually copious, this being an evidence that the kidneys have recovered from any state of extreme congestion, and as emunctories of excretory matter are actively at work, we may probably consider it as "always a favourable sign."[3]

If the woman has not yet passed the climacteric, which to have done would so far be in her favour, it is necessary to take the time of occurrence of the menstrual molimen into consideration. At such time the tendencies of the circulation are towards the organs of the pelvis, which are then more or less congested, and therefore more prone than usual, upon injury, to the occurrence of hemorrhage.

The best time for operation is probably very shortly after the catamenia have ceased, and this point, it will have been noticed, was acted upon in the case now reported. In this connection, I would call attention to the remarkable fact that an effort at menstruation, attended with slight hemorrhagic flow for the greater part of a day and a half, occurred nearly at the regular period after the last menstruation prior to the operation; not merely the uterus, but the ovaries, which are undoubtedly the initiative source of the menstrual effort, being now absent. The occurrence of this discharge purely from the tip of the cervix may throw some light upon that occurring from a similar seat in some instances of pregnancy; its ultimate causation in the present instance must be explained as the final oscillation of a pendulum, from which all motive force had been withdrawn.

Speaking, as I have done, of the prophylaxis by which we may reasonably hope to diminish the mortality of abdominal section, and its thus far most dangerous accompaniment, extirpation of the uterus, I should do wrong did I not express my opinion of certain points during section, hitherto deemed of the first importance. They are the following. It will be noticed that upon these points I differ from many operators:—

1. The temperature of the atmosphere.
2. The length of the incision.
3. The treatment of the stump, or the pedicle, if ovarian.
4. The closure of the external wound.

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[1] Worcester Journal of Medicine, Feb. 1854, p. 45.

[2] See discussion upon this point at Obstetrical Society of London in 1863, Transactions, vol. v. p. 35.

[3] Clay: Transactions of Obstetrical Society of London, vol. v., 1864, p. 71.

I have already incidentally mentioned other points of very great interest. To these and to still others I will briefly refer.

1. The differential diagnosis once made, or decided to be impossible, the question of operation must turn upon the patient's history, her present condition, her own wish, and the surgeon's courage.

a. If the surgeon is not ready for *any* complication that the section may disclose, he is unfit *ever* to operate.

b. The wish of the patient must be mainly governed by her attendant's decision. An invalid, torn by contending emotions, and swayed by the conflicting advice of ignorant friends, cannot judge wisely for herself. The surgeon, the accoucheur, the physician have daily, and ought, to take the responsibilities of such decision.

c. Is death imminent without the operation, the chance of life it affords should be given; it being recollected that the more the vital powers have been undermined by delay, the less has this chance become.

d. If the tumour has rapidly become developed, while on the one hand the probabilities of the disease being malignant may be increased, so has the necessity for rendering immediate aid.

2. The diagnosis of malignant disease, of a multilocular cyst, of uterine complication, or of adhesions, is, under the circumstances now described, no necessary bar to the operation. Every surgeon of course desires that his cases should be promising, and free from complication; he dislikes the odium of an unsuccessful attempt, and accordingly is prone to "select" them. Thus Clay has been consulted for "sixteen hundred cases" of ovarian disease prior to 1863, and has operated but one hundred and sixteen times;[1] Baker Brown, in 1863, "has examined many hundreds, he might say thousands of cases,"[2] and in 1861 had performed section but in nine, then preferring less certain methods of treatment.[3] And yet, of the cases where the operation has been completed, perhaps as large a proportion of the most unpromising have succeeded as of the simple and uncomplicated ones; probably because of the more careful after-treatment that was supposed necessary. The excess of care in selecting cases to which I have referred may be well for the operator's reputation, but it is not always for the patient's advantage. Patients are frequently pronounced by physicians to be incurable, who are perfectly legitimate sub-

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[1] Trans. of Obstetrical Society of London, v. p. 64. [2] Ibid., p. 73.

[3] Surgical Diseases of Women. The extent of the prevalent fear lest a case prove uterine, almost exceeds belief. During the past year I have received from New Hampshire by the kindness of Dr. McIntire, of Concord, an unilocular ovarian cyst, well pediculated, and without adhesions, the uterus being perfectly healthy, removed post mortem from a patient upon whom an operation had not only been advised against, but prevented, by a noted operator of my own State, on the ground that the case was one of undoubted uterine disease. I could mention similar cases, but they are probably familiar to most of my readers.

jects for operation. Abdominal section is still in its infancy, and objections formerly considered unsurmountable are now in practice found trivial. I must here quote a word from the last published work upon the subject, that of the present year, by Spencer Wells, to enter my protest against the too timid selection of cases he would inculcate. "I cannot," says Mr. Wells, "send forth this volume without a word of caution. A discovery which has triumphed over opposition of all kinds, honest and scientific, prejudiced and ignorant, may still be ruined by the support of rash, inconsistent, thoughtless partisans, whose failures do not reflect so much discredit on themselves as on the operation which they have badly performed in unsuitable cases. Indications are not wanting that ovariotomy has entered upon this phase of progress; and there is reason to fear that judicious men may be influenced by the outcry of the foolish, and that a triumph of surgery which has been won by great labour and care, may be arrested before it is complete, may even be converted into temporary defeat, by the indiscriminate support of zealous, but injudicious advocates."[1] Now, several of Mr. Wells' greatest successes have been cases where the diagnosis was doubtful; and, on the other hand, he is very averse to operating, or to completing an operation, where extensive adhesions are found to exist. Clay, of Manchester, on the contrary, believes that adhesions, however extensive, are of minor importance, unless deep in the pelvis. "When I first commenced my operations," he says, "I was inclined to think more seriously of adhesions than I do now; in fact, many cases were rejected at that time as unfit for operation, which, if now presented to me, I should not hesitate to operate on. Some of the worst cases of adhesion I ever had, recovered as well and as rapidly as any other."[2] So far as the relative success of these operators is concerned, Spencer Wells, fearing adhesions, has performed abdominal section for ovarian and uterine disease (1865) 130 times, with 80 recoveries,[3] or 61 per cent.; while Clay, disregarding adhesions, has performed this operation for ovarian and uterine disease (1863) 116 times, with 80 recoveries,[4] or 68 per cent.; a balance of 7 per cent. in favor of the bolder practice.

3. An operation determined on, the less previous manipulation the better. There is good reason to believe that many a case has been lost by merely allowing the abdomen to be unnecessarily kneaded by an interested or inquisitive circle of medical friends. Such manipulation would seem the surest possible way to predispose to an attack of peritonitis, were this desired.

4. The patient should have been prepared by previous medical prophylaxis.

5. She should have become accustomed to what I have called the local

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[1] Loc. cit., p. xiv.

[2] Obstetric Surgery, p. 162.

[3] Loc. cit.

[4] Trans. Obstetrical Society of London, vol. v. 1864.

climate in which she is to remain after the operation. That is to say, a city patient transferred to the country should not be operated upon until some weeks of residence had elapsed, the same rule applying to a country patient transferred to the city. Of course the atmosphere of a private house is, all other things being equal, preferable to that of the best ventilated hospital; to say nothing of the chance therein of peritonitic infection from erysipelas or surgical fever. It may be said, on the other hand, in view of the immense importance of the after-treatment, that the best nurses are to be found in hospital wards; in emergencies, however, they can often be transferred from thence, should this be thought advisable.

6. The temperature of the room at the time of operation has been much insisted upon. For instance, my friend Prof. Elliot, of New York, in a late ovarian section at Bellevue Hospital, kept himself for a full hour, with a company of no less than twenty-seven medical men, in an atmosphere heated to between 90° and 100° Fahrenheit.[1] My own impression is that one of from 65° to 70° answers every practical purpose, and is much less debilitating both to operator and to patient.

7. That an anæsthetic should be given, I need hardly remark. This would of course be done, as much for the operator's convenience as for the patient's comfort. Not only, however, is suffering thus annulled, but there is reason to believe that, just as obtains in midwifery, the percentage of recoveries may be proportionately increased. I am inclined to think, moreover, and the remark applies to many other surgical operations, that it may be of advantage to keep the patient insensible for some time after the operation has been completed. In the case now reported, the anæsthesia was steadily continued for more than three hours. Much depends upon the method of administering the ether, for I believe that with attention to this point, the troublesome syncope, nausea, and vomiting, that so frequently ensue, and in the latter instance increase the risk of protrusion of the intestines, may be in great measure prevented, as in the present case.

8. The length of the incision has varied between extremes, each having its champions. My own practice is to make as short a one as seems possible to answer my purpose. In the present instance, the wound was but five and a half inches, extending from the umbilicus downwards, but not reaching the pubes, and yet it was fully sufficient for the extraction by a little taxis, of the enormous mass, without materially lessening its bulk. When the opening is extended towards the sternum, it is almost impossible to prevent the intestines from protruding during the operation, and to keep up their vital heat. I am satisfied that a frequent cause of subsequent peritonitis is from the excessive manipulation and chill to which the viscera are necessarily subjected in cases of the long incision; and

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[1] N. Y. Med. Jour., Sept. 1865, p. 409.

that in other instances, the efforts at their retention or replacement are productive of the entanglement of loops upon each other and their subsequent strangulation; while in still others, like Prof. Peaslee's case of uterine extirpation, the fatal result is consequent upon an escape of the intestines between the sutures of the wound, and thereon strangulation and subsequent peritonitis or gangrene. By the short incision there is also a less exposure to the atmospheric air of those of the abdominal contents that are not protruded, and therefore somewhat less risk of shock or inflammatory action.

9. Some surgeons, particularly my friend Dr. Peaslee, have thought they found advantage in the employment of an artificial serum, with which to keep the viscera more thoroughly protected from external causes. I believe, however, that it is hardly necessary. Far better is it to direct attention to those external causes whose presence can be wholly avoided; as one of which, the wearing of rough signet rings, which in two instances I have seen introduced into the cavities of both abdomen and pelvis.

10. To the comparative non-importance of adhesions I have already alluded. Where they are absent, it is of course an advantage. Where present, they may be torn (best), cut by ecraseur (next best), or by the clean incision. In the latter instance, only, is there much risk of hemorrhage; to prevent or arrest which, if torsion is insufficient, more direct means become necessary, but it should be by acupressure or metallic ligature, and not by those of organic material.

11. The same remarks apply to division of the pedicle, if ovarian, and of the cervix, if uterine. Many of the deaths after these operations have been from slipping of ligatures, or from septæmia in consequence of arterial sloughs,[1] or from irritation produced by the presence, long continued or temporary, of organic sutures or ligating threads.[2] In Spencer Wells' fatal case of uterine extirpation, the stem of the ecraseur bent and it became useless, a clamp was applied and it broke, and there was copious and alarming hemorrhage; the case showing the necessity of having duplicate instruments of reliable construction. In one of Kimball's uterine cases, his third and last, death was occasioned by the slipping of a ligature on the third day, and consequent fatal hemorrhage.[3] The same occurred on the second day in Baker Brown's late unsuccessful case.[4] In Kimball's successful case, the ligatures were brought through the external wound and there remained eight months after, "causing considerable

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[1] "Minute Morsels of Dead Flesh in the Raw Cavities or upon the Raw Sides of Large Wounds." Simpson's Acupressure, p. 43.

[2] The Law of Non-Tolerance of Living Tissues for the Presence of Dead Foreign Organic Bodies. Ibid., p. 478.

[3] Boston Med. and Surg. Jour., vol. lii. p. 254.

[4] Transactions of London Obstet. Society, vol. vi., 1865.

annoyance from local irritation."[1] In Parkman's unsuccessful case at the Massachusetts General Hospital, death occurred in twelve hours from contraction of the tissues inclosed in the ligatures and consequent hemorrhage, "although the ligatures were drawn as tightly as could be done by a strong man."[2]

It is futile to rely upon ligatures merely, whether passed through or merely around the pedicle, or to attempt to prevent hemorrhage, as Baker Brown has proposed since his late failure, and as has been done by others, by dividing the tissues by the actual cautery, which by causing a slough would only predispose to secondary hemorrhage or to peritonitis. The ecraseur enables us to avoid these risks, and to drop the pedicle, whether ovarian or uterine, back into its natural position in the cavity of the pelvis. In this manner we do not require the prolonged use of a clamp, so difficult often to apply, and by its traction almost insuring severe pain and excessive inflammatory action.

12. In extirpating the uterus, should the ovaries be also removed, provided they are healthy? I believe that it is better that they should. In two of Burnham's cases the ovaries are said to have been left; one of these women recovered, the other died. In Clay's successful case, but one of the ovaries is reported to have been removed. It is difficult to explain how this can have been done compatibly with the removal of the greater part of the uterus, without destroying so much of the remaining organic attachments of the ovaries as to cause their death, unless indeed adhesions had been previously formed between themselves and contiguous tissues. In some instances it would be impossible to operate without removing all the uterine appendages. In others, their being allowed to remain, supposing them to preserve their normal activity, might subject the patient till the time of the climacteric to all the annoyance of the menstrual molimen, without the relief to the disordered circulation afforded by the normal discharge.

I find that Koeberlé, in a recent publication, expresses a similar opinion:—

> "The extirpation of the ovaries," he says, "which had already been rendered useless by the existence of the large fibroid, which necessarily prevented the normal evolution of pregnancy, has relieved the patient of her menstrual periods, and of all the inconveniences connected with them, as well as from the diseases which spring from the ovaries themselves."[3]

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[1] Boston Med. and Surg. Jour., vol. lii. p. 253.

[2] Lyman, Non-Malignant Diseases of the Uterus, p. 75.

[3] De l'Ovariotomie, Paris, 1865, p. 92. The above statements are commented upon by a reviewer in the *Med. Times and Gazette*, for Feb. 1865, p. 209. "As these arguments," says the anonymous writer alluded to, "apply with equal force to the healthy female, we can only conclude that M. Koeberlé regards the whole sexual organization of the female as a mistake and a nuisance, which is to be removed at the earliest opportunity." Need I state that such criticism is as un-

13. In this operation, of all others, haste should be avoided. As many of the unsuccessful cases have perished from concealed hemorrhage, from vessels that at the time of the operation received or seemed to deserve no attention, as from a truly secondary flow in consequence of the slipping of a ligature or of an ulcerative opening of the vascular canals. I have already mentioned the methods by which these latter dangers can be prevented. In the present instance it was nearly, if not quite, three hours before the external wound was finally closed. After nearly a dozen large vessels had been closed by metallic ligatures, which it is my intention shall remain indefinitely in their present bed, and perhaps twice as many more had been secured by torsion, there remained a general sanguineous oozing from the sites of adhesion and the stump of the uterus, sufficient for a while rapidly to fill the cavity of the pelvis. This was finally overcome, so far as we could judge, by mere exposure of the wounded surfaces to the air. Theoretically, this course should have killed the patient; practically she had never a bad symptom.

14. The method of closing the wound is of no small value. I believe in metallic sutures, passed through the peritoneal membrane, by which means exact apposition can be secured; and by having no ligatures to bring through the wound, themselves a source of irritation, to serve as a track for pus, we also insure thorough closure. In the present case, I had complete union by first intention during the whole length of the wound; in this operation as elsewhere, of the greatest importance.

15. Of the dressings of the wound, I have also a word to say. I used *none*. There was not even a strip of sticking plaster between the deep sutures, nor a single superficial suture of any kind. There was not even a wet compress. The bed-clothes were kept away by a suitable wooden frame, and till some time after the sutures were removed, which was on the thirteenth and fourteenth days, nothing whatever was allowed to touch the abdomen of the patient.[1]

16. As in all surgery, everything depends upon the after-treatment. I believe in a full diet, as free as can be borne; and while we are governed in a measure by the state of the pulse, we can govern the circulation itself and so in a measure prevent threatened inflammatory action, by arterial sedatives, as veratrum viride, whose importance in surgical practice has as yet hardly been appreciated. The less opium that is given the better. If the patient has been under proper prophylactic treatment, the bowels will probably not be irritable. The occurrence of irritability may be further guarded against by an astringent diet, as here, where the main dependence was at first upon boiled flour and milk; should disturb-

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founded as it is discourteous and illiberal, and yet by just such objections is it that the advance of medicine and surgery is often sought to be stayed.

[1] See Local Requisites for the Primary Union of Wounds. Simpson's Acupressure, p. 116.

ance take place, an opiate by rectum is far better than the same by mouth, and produces much less constitutional depression. The first attempt at a fecal discharge, even by enema, and the first recurrence of the time for the usual menstrual molimen, are of all others seasons for especial anxiety. These passed safely, and the patient will probably do well.

The operation, when successful, effects a radical cure. Kimball's case, operated upon more than ten years ago, is now, November 17, 1865, "in the enjoyment of perfect health, having been so ever since her recovery." Burnham's first patient, also dating from more than ten years, "continued well four years after the operation, since which time she has been lost sight of;" his second case "remains well at present," October 9, 1865, over a year. Clay's patient, nearly three years after, "is now, October 17, 1865, in excellent health."

In none of the successful cases on record did there exist such apparently insuperable objections to the performance of the operation as in that now reported, from the enormous size of the tumour, and the extent and great vascularity of the pelvic adhesions. In none was convalescence so rapid, in none such perfect immunity from the slightest interruption to its progress. The case goes upon record as evidence of the most positive character, of the truth of Prof. Simpson's views, laid down in his work upon acupressure, as to the local and general requisites for the primary union of wounds and the diminution of the present high mortality from surgical operations.

In conclusion, I shall best serve my friends in this department of practice if I now express my creed, as to abdominal sections, in a few succinct general formulæ.

1. Almost all ovarian tumours, a far greater majority than has been generally supposed, may be safely removed by abdominal section.

2. A certain proportion, as yet not ascertained, of uterine tumours, fibroid or fibro-cystic, may be safely removed in a similar manner.

3. A large proportion of the fatal instances of either operation referred to, may be traced to neglect of simple precautions, prophylactic, immediate or subsequent.

4. Others still, to the fact that the patient was allowed to linger without assistance, till she was already practically moribund, before the commencement of the operation; and

5. Still others, that the surgeon's heart failed him after the abdomen had been opened, and the operation was not completed.

I would not willingly be thought one of those "rash, inconsistent, or thoughtless partisans," by whom, it is Spencer Wells' opinion that abdominal sections may be brought into discredit. I have been compelled to see that the condemnations of uterine extirpation by abdominal section have been no more decided than those pronounced against ovariotomy but a few years since,[1] and that operation has now become of very common occurrence; that the mortality of the earlier uterine extirpations was no greater than that in many isolated groups of the other operation; that a large proportion of the fatal cases might undoubtedly have recovered, had greater prophylactic and subsequent care been exercised; and that no less than four-sevenths of the later cases of the operation have been crowned with success. It is evident from these facts that the operation now described ought *a priori* to be viewed more kindly than were the first ovarian extirpations. In skilful hands, it is not impossible that it may yet attain as great and as deserved renown. In no department of surgery is the common proverb more constantly true, and I apply it to the life of an otherwise condemned patient, and not to the operator's reputation alone, "Nothing risked, nothing obtained." By leaving the case to nature, we must yield our patient to certain, and often to speedy death; by operating, on the contrary, we may lift her from the grave into which she is already descending, and insure for her a long, comfortable, and perfectly healthy life.

> "Your duty and mine," says West, "is not to sit down in apathetic indifference, doing nothing, trying nothing, for a patient's cure, because her disease is one which hitherto has proved almost invariably mortal: but rather, patiently, carefully, with much mistrust of our own powers, much watchful scrutiny of our own motives, to apply ourselves to the trial of every means by which suffering may be mitigated or life prolonged. To this our common humanity prompts, our obligations as medical men compel us. It is to misinterpret both very grievously, if we not merely content ourselves with doing nothing, but take shelter under noisy censure of the conduct and uncharitable construction of the motives of those who read their duty differently."[2]

ART. IX.—*Cases of Excision of Bones.* By JAMES B. CUTTER, M. D., of Newark, N. J. (With two wood-cuts.)

CASE I. *Removal of entire humerus and heads of ulna and radius.*—John E. F. Cleghorn, private 1st New Jersey Cavalry, was wounded in the left shoulder by a minié ball, November 27th, 1863, at the battle of "Mine Run," Va. The ball passed through the shoulder-joint, fracturing the *head* and *neck* of the os humeri, which was removed by Surgeon Clark on the field three days after the receipt of the injury. His incision, made with operation, was a longitudinal one, carried down in front of the deltoid muscle through the biceps sufficiently for the removal of about three inches of the shaft of the bone.

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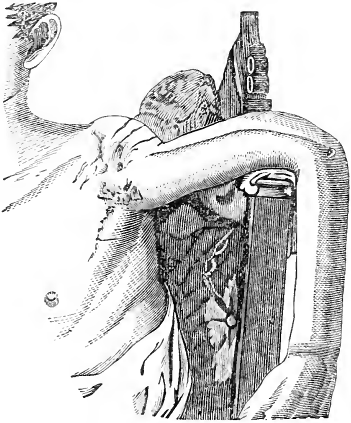
[1] For instance: "An unbiassed and calm review of all these points cannot fail to satisfy every one but those who take this means of bringing themselves into notoriety, that the abdominal section, for the removal of *ovarian* tumours, is uncalled for, is a useless sacrifice of human life, and never can become one of the legitimate operations of surgery."—*Edinburgh Medical and Surgical Journal*, April, 1844, p. 471.

[2] Diseases of Women, p. 419.

The patient states that about ten days after the operation an abscess formed at the elbow-joint, which was opened, and gave exit to a large quantity of pus. This opening existed when the patient was admitted into the "Ward" General Hospital, Newark, New Jersey, April 29th, 1864. There were other openings in the arm through which the probe would readily pass, revealing extensive necrosis of the entire shaft of bone and elbow-joint.

July 21, 1864. Operated for the removal of entire bone, including the heads of ulna and radius. Continued the incision made in the first operation, down the ulna line of the arm to the forearm; removed the bone with very little injury to the surrounding parts. No ligatures were required, as the bleeding was completely arrested by the use of cold water. It is proper to state that the tubercle of the radius was left, leaving the insertion of the biceps muscle. The lips of the wound were brought together with silver sutures and adhesive plaster, and comfortably supported at a right angle with splints.

Fig. 1.



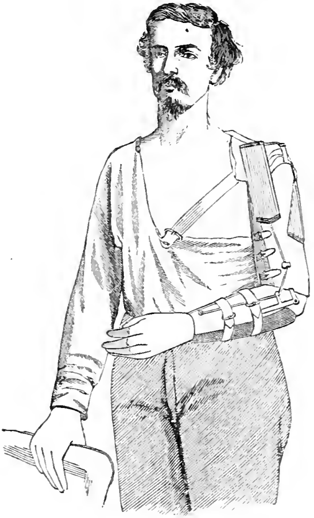
We succeeded in getting union by first intention almost throughout the entire length of incision. Three weeks after operation wound healed completely, and patient moving about.

The carpal, metacarpal, and digital muscles were left powerfully subservient to the will for grasping, holding, and pulling, though there is some paresis of the extensor-carpi digitorum. The arm, forearm, and hand are daily regaining a healthy tone; biceps and deltoid muscles contract strongly, zigzag for lack of fixedness; the entire arm and hand are somewhat atrophied. The arm is shortened one and a half inch, is extremely flexile and ungovernable.

Three months after the last operation the patient was presented to Dr.

E. D. Hudson, of New York City, with an order from the Surgeon General to have an apparatus made and applied. The following is the description of the appliance given me by the doctor :—

Fig. 2.



1st. A scapular piece fitted over the shoulder, with an artificial acromion process for a *point d'appui.*

2d. A somewhat spiral humeral case of wood and leather, to fit and encircle the whole arm snugly, to keep the muscles in place, and supply fixedness.

3d. An arthrodial joint (oscillatory), to unite the humeral and scapular parts, and extend the arm from the body.

4th. An aponuerotic case for the forearm, extending to the carpal end, to compact and prevent displacement of muscles in flexing.

5th. Ginglymus elbow-joints uniting the humeral and cubital case with greaves; stanchion appendid for tendons.

6th. Representative pectoral and brachial adductors and flexors of rubber webbing attached to the tendons, to draw the arm forward over the chest, and flex the forearm.

7th. Temporary representative extensor carpi digitorum, to antagonize the flexors of the wrist, hand, and fingers, to restore the tone of the extensors.

Incipient result of treatment.—Arm and forearm supported, strong, and reliable; arm oscillates at the shoulder; forearm flexes at will, at a right angle with the arm; holds parcels in his hands, lifts a pail of water perpendicularly, pulls strongly on a horizontal line. With practice will regain a highly commendable and gratifying use of his arm and hand, and demonstrate the exceeding utility and propriety of the extreme exsection as a beneficial alternative for an amputation.

Dr. Hudson writes under date of November 27, 1865, that he has "since improved and reapplied this apparatus, omitting the waistband, and substituting an elastic strap across the chest from the shoulder pad to a soft pad passing beneath the axilla of the opposite arm; further than that, the general principles remain the same; and he is improving in the use of his arm. He was in here a few days ago, took an arm-chair and swung it around at an elevation of 45°—almost at a right angle with the body. Drs. F. H. Hamilton and Teats were in, saw the case, and were highly interested and gratified with the operation and results.

CASE II. *Removal of six inches of tibia, with the formation of new bone.*—Wm. H. Marston, private, Company "B," 17th Michigan Volunteers, age 23 years, of feeble constitution, was admitted to the "Ward" U. S. General Hospital, Newark, New Jersey, August 18th, 1864, from Washington, D. C., having received a severe gunshot wound of right leg, before Petersburg, Va., June 17th, 1864. A rifle ball (supposed by the patient to be an explosive one) struck the tibia anteriorly just below its tubercle, *drilling* the bone in its passage, then emerged posteriorly, just below the head of fibula, and behind that bone the tibia was not fractured, but, as I stated above, was *completely drilled*, the opening being large enough to readily pass the index finger.

The patient, when admitted into the "Ward" Hospital, had an extensive granulating wound, extending from the tubercle of the tibia to within three inches of ankle-joint, and three inches in width at its widest point; granulations flabby; discharge purulent and very abundant; four inches of the tibia uncovered, and protruding from the granulations, the bone was darkened in colour, and presented the worm-eaten appearance. This extensive wound was the result of hospital gangrene which the patient suffered while at the Finley Hospital, in Washington.

The general condition of the patient, at the time he was admitted into the "Ward Hospital," was anything but desirable: appetite very much impaired, reduced in strength by the profuse discharge from wound, and night-sweats which had existed for some time.

The patient was permitted by the surgeon in charge, Dr. George Taylor, Surgeon U. S. Army, to go into the country, some six miles distant, to reside with some relatives, where he could have the benefit of fresh air, good diet, and attendants, and be relieved from the confinement, noise, and confusion which always exist in a large ward in a hospital of this kind.

Treatment, stimulating and sustaining throughout.

October 1. Patient has gained greatly in strength in the last few months; the large sequestrum of bone being loose, it was thought advisable, considering the excellent condition of the patient to operate at once; accordingly preparations were made, and at 3 P. M., assisted by my much esteemed friend, Dr. Wm. S. Ward, the patient was put upon the operating table, and placed under the influence of chloroform and ether, and the operation commenced. An incision was made from the tubercle of the tibia, extending down to within two inches of the ankle-joint.

To remove this large sequestrum of bone (which measured six inches in length, the size of the entire tibia), it became necessary to cut through the involucrum at two points, the inner surface of this thin shell of bone was then thoroughly scraped, the wound cleansed, and its lips brought together by three wide strips of adhesive plaster which encircled the whole leg; dry lint and bandages constituted the dressing.

It should be remarked that the hemorrhage during the operation was very abundant, so much so as to require the application of the tourniquet, no ligatures were necessary, however, as the use of cold water succeeded in arresting the hemorrhage completely.

The recovery of the patient was complete though tedious.

September 1, 1865. The patient has been discharged the service, and came to my office this morning for the purpose of having a photograph taken of his sound and useful leg. Stated to me that a few days since he walked six miles upon this foot without the use of crutch or cane, and considers it full as useful as its neighbour.

Art. X.—*Amputation of Right Shoulder-Joint.* By W. P. Moon, M. D., late Executive Officer of Mower U. S. A. Hospital, Chestnut Hill, Pa.

This case is presented, on account of the form of incision differing from any laid down in the works on surgery, with the hope that it may be of interest to the profession, and may prove of service to any one who might happen to have an injury of the same character to treat.

It has been seen and admired by several surgeons, among them Dr. Stephen Smith, of New York. I believe it has advantages over some operations, owing to the division of less muscular tissue, thus giving less surface to heal, consequently requiring a shorter time to effect a cure, and leaving greater rotundity and beauty to the shoulder:—

Samuel Irwin, Corporal Co. I, Sixty-seventh Pennsylvania Volunteers, aged 23, sound health and temperate habits, was admitted to Mower U. S. A. Hospital, September 24th, 1864, for gunshot wound of right shoulder, received at Winchester, Va., September 22d, by conical ball. Bullet entered at anterior border of deltoid muscle, four inches below acromion, injuring but not fracturing the humerus, and emerged one inch anterior to axillary border of right scapula. To all appearances the injury to the bone was only a slight contusion, but subsequent results demonstrate what serious consequences may follow mere contusions of the long bones of the body as well as similar injuries to the bones of the head.

The case did well under simple dressings until Oct. 15th, when sloughing of anterior wound supervened, which was treated with bromine, followed by a solution of permanganate of potash, x grs. to aquæ, ℥j. Extra diet, milk punch and beef essence were administered.

October 28. Hemorrhage occurred from anterior circumflex artery, which was ligated.

November 2. Ligature separated, and was removed.

December 6. Abscesses were discovered, forming about the middle third of the arm, and a free incision was made to relieve the parts of pus. The humerus was found to be denuded of periosteum to a large extent. The patient failed rapidly, and it was feared he would succumb under the exhausting effects of the drain upon the system. Quinine and iron were added to the treatment, also a pint of pure cream to daily diet.

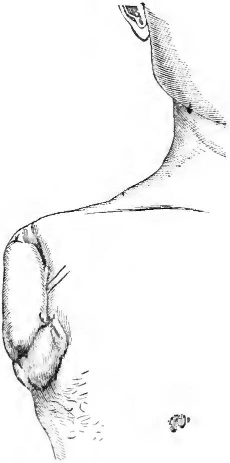
12th. Quite improved, appetite increasing, and general health better, although extensive necrosis is going on, involving nearly the entire shaft of the humerus.

January 2, 1865. Improving, but necrosis still going on.

9th. Sloughing occurring, a consultation was held with the consulting surgeons Drs. D. Hayes Agnew and T. G. Morton, when it was decided to amputate as soon as the condition of the patient would warrant.

13th. I performed the operation, the patient being thoroughly chloroformed and placed in a chair, assisted by Drs. Morton, Sheppard, Fell, McGrath, and Hendrie, by making an incision from the acromion process down the anterior border of the deltoid five inches and a half in length, on the inner side of the cicatrix caused by the operation for ligating the anterior circumflex artery. Another incision was made on the outer side of this cicatrix for the purpose of removing all hardened tissue formed by it. A transverse incision, posteriorly, was then made through the deltoid down to the bone, after which the head of humerus was dissected, and the knife passed down behind the humerus close to the bone until it reached the transverse incision, where it was turned outward and a circular incision made of the remaining muscles. A few ounces of blood only were lost in the operation, the arteries being secured, after the first incision, by an assistant grasping them. The patient reacted very slowly, appearing for a time more dead than alive.

The after-treatment consisted in the application of *dry dressing* to the wound for the first five days, or until active inflammation had ceased and free suppuration set in, followed by a *very light* simple cerate dressing. All but an inch and a half of the lower or circular incision and one inch of the upper, just below the acromion, healed by the first intention.



No medicine was given during the remaining treatment. Cream and beef essence were allowed every two hours, and brandy every other hour, for five days, when tender solids began to be taken, in addition. From the day succeeding the operation the case went on rapidly to convalescence—patient walking about the hospital in *twelve* days, and on the twenty-first day he visited his family in this city, where he now resides. He wears an artificial arm which he can joint at the elbow by the action of shoulder, and is able to carry considerable loads with it.

The present appearance of the shoulder will be seen by the accompanying engraving taken from a photograph.

The humerus was necrosed entirely off at the olecranon fossa, below and about three inches from the head of the humerus above. An attempt was made by nature to repair this extensive destruction of bone tissue by throwing out new bone the entire length of the shaft.

ART. XI.—*A Peculiar Case of Hæmatocele.* By CHARLES M. ALLIN, M. D., Surgeon to the New York Hospital.

THE occurrence of hæmatocele, succeeding or combined with hydrocele, or resulting from the wounding of some vessel in the operation of tapping the tunica vaginalis, is not very unfrequent. Its spontaneous appearance and growth, however, are quite rare, and the additional distension of the sac *by air* has never, so far as I have been able to learn, been noticed. I have therefore considered that the following case, which presented itself during my recent term of attendance at the hospital, was worthy of record, though I regret that the final result was not so satisfactory as I had reason to expect. This result, however, is not fairly attributable to a cause necessarily connected with the disease or its treatment, as was clearly demonstrated at the post-mortem examination.

H. W., a German, 38 years of age, *a shoemaker*, was admitted into the hospital, August 15, 1865. He stated that, fifteen years ago, his scrotum upon the right side began to swell without any apparent cause. This enlargement continued, slowly but steadily, to be augmented until about six years since; from which time it remained stationary, at about the size of a large orange, until three weeks ago, when suddenly, and without either injury, unusual exertion, or other assignable cause, it became distended, in a single night, to the dimensions presented at his admission. There had never been any treatment employed from the beginning of the swelling. The tumour now very closely resembled, in size and form, a bullock's heart, with the apex below. Its dimensions, by measurement, were as follows:—

Vertical and lateral circumference, 22 inches. Vertical and antero-posterior circumference, 18 inches. Horizontal circumference at base, 13½ inches. Horizontal circumference at junction of upper and middle third, 17 inches. Horizontal circumference at junction of lower and middle third, 13 inches.

The right testicle could not be distinctly recognized, and the dioptric test failed to elucidate its exact position or the nature of the tumour, there being only slight translucency, if any, at the apex, and absolutely none elsewhere throughout its extent. The tumour was very tense, elastic, and slightly tender; fluctuation was very indistinct; the superficial scrotal veins were enormously distended, and over the whole upper portion there was *very marked resonance on percussion*. There was no impulse felt when the patient coughed, though there was an unusual eminence along the course of the spermatic cord, fully up to the abdominal ring. The other testicle was normal in size and position, though crowded to the left by the immense development of the right half of the scrotum. The penis was reduced in external size to a mere knob upon the upper surface of the tumour. There was but little abnormal heat about the parts, and the patient only complained of the dragging weight of his huge scrotum.

On the 17th, for the purpose of exploration, I made a small incision in the scrotum, just below the middle of its anterior surface, and passed a medium size trocar and canula into the cavity of the sac. The latter proceeding was accomplished with some difficulty, owing to the great thickness and firmness of the walls of the sac. On withdrawing the trocar, there passed through the canula a dark chocolate-coloured fluid of about the consistence of strong beef-tea. This was followed by a quantity of small fibrinous coagula, and a *copious discharge of air.* The discharge was not free, the canula being much obstructed by the flocculent masses, but by freeing the canula with a director, and by pressure, especially from above, a considerable quantity more of the same substance, and more air escaped. *Neither the fluid nor the gas was at all fetid.* There were evacuated at this operation about twelve ounces of fluid, reducing the tumour to about two-thirds of its former size. Its resonance, however, was persistent.

This explorative proceeding of course perfected the diagnosis of hæmatocele, though the extraordinary presence of so large a quantity of air in the cavity of the sac, and this air so free from odour, was to me a new feature, and one not easily explained.

On the 21st, the patient's general condition was about the same as before the puncture; but, a little circumscribed inflammation around the orifice where the trocar was introduced, and a slight discharge of pus presenting, with a probe-pointed bistoury I enlarged my former incision, and evacuated the entire contents of the sac, the quantity being from a pint to a pint and a half of fluid, and again a large amount of gas. The character of the fluid was similar in appearance to that which escaped at the first opening, except that there were at the bottom of the sac about two ounces of pus. The entire contents of the tumour were now, not as before inodorous, but very fetid. When emptied, the walls of the tunica vaginalis were found to be nearly an inch in thickness.

Upon consultation with my colleagues in the hospital, it was decided that the sac should be extirpated. Accordingly, the patient being etherized, I removed the entire contents of that side of the scrotum by the usual operation. All the tissues of the scrotum were very much thickened, especially the dartos. The vessels encountered were enlarged and bled quite freely, and the cremaster muscle was immensely hypertrophied, simulating a normal external oblique. A redundant portion of scrotum, which was largely infiltrated with serous fluid, was now cut off, and the wound closed except the inferior two inches.

The patient's condition was very good, and the appearance of the wound was very satisfactory, though there was some tenderness around and above the inguinal ring, until the fourth day after the operation. At this time, erysipelatous inflammation showed itself in the wound, became rapidly phlegmonous in its character, and extended upwards and outwards beyond the anterior superior spine of the ilium. Free suppuration followed, and though counter openings were made, the deep burrowing continued, and the patient gradually became more and more exhausted, and died Sept. 2d.

At the *post-mortem* examination, the suppuration was found to have extended in the course of the fibres of the obliquus externus, destroying that muscle throughout nearly its whole extent. The cartilage of the tenth rib was exposed, and below this point the only vestiges of the muscle were a few scattered fibres. Even the aponeurosis over the inferior third of the rectus abdominis was destroyed, together with some of the connective tissue between its fasciculi. The remains of the cord in the upper part of the scrotum were apparently sound; and, on opening the abdominal cavity this supposition was verified by finding the spermatic canal entirely closed at its exit, though there was an unusually large and patulous internal ring. The vas deferens was of normal size, pursuing its natural direction to the neck of the bladder, and there was not the slightest evidence of inflammation along its course or in any portion of the peritoneum.

ART. XII.—*Instruments for Facilitating Surgical Operations.* By D. PRINCE, M. D., of Jacksonville, Ill. (With two wood-cuts.)

Two things are most desirable for a surgeon: 1st. To possess the versatility and dexterity to perform operations with the smallest number of instruments and of the simplest construction; and 2d. Instruments of easy management, the use of which may shorten the duration of an operation, and diminish its danger.

This contribution is to the latter of these two ends.

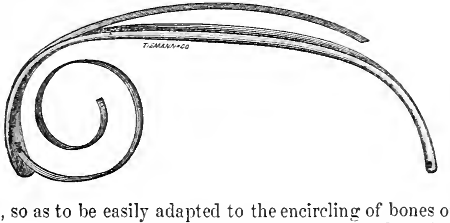
I. In an article upon exsections and amputations, in the number of this Journal for April, 1865, a *retractor* of simple construction is figured, the original design of which is attributed to Dr. C. A. Pope, of St. Louis.

By the aid of Mr. Stohlmann, of the firm of Tiemann & Co., N. Y., the instrument has been modified to answer several purposes, in addition to the one for which it was originally intended.

The first design of the *retractor* was to enable the operator to dispense with the use of the chain saw in exsections of the upper end of the humerus and some other bones, greatly shortening the time necessary for the operation; and in amputation of the humerus and femur, to enable the operator easily to saw the bone with a common saw, before cutting the posterior or inner flap containing the principal artery. By this proceeding, the operator is enabled to hold the artery between the thumb and fingers of his left hand while the final cut is made through the soft parts. The great vessel is thus exposed clearly to view, and can be immediately seized and tied. The necessity for a tourniquet, and for pressure upon the artery by the fingers anywhere in the proximal direction from the place of amputating, are both obviated.

As seen in the figure (Fig. 1), the instrument retains its former shape and function at one end. This curved probe, on the right of the figure, is untempered, so as to be easily adapted to the encircling of bones of different diameters, in order to insinuate it between the bone and the soft parts; to be followed by the body of the instrument, which then effectually separates the bone from the uncut portion of the soft parts. Then, upon turning the instrument over, the groove, upon that aspect which is convex in the direction of its length, is brought next the bone, to receive the saw as it passes through the bone. The other end of the instrument is modified to serve three purposes.

Fig. 1.



First, it is flattened, in order that it may be a convenient *retractor* for holding aside the lips of any wound, in the progress of an operation.

Second, it has a thick edge, for the purpose of peeling up periosteum in amputations, exsections, or the destruction of portions of the provisional sheath over sequestra, in the perforations necessarily made through which to extract the fragments of dead bone. The instrument then performs the office of periosteotome. By preserving all the periosteum, in connection with the superimposed soft parts, the destruction of bone necessarily made, as steps in the operation, may be expected to be completely repaired. The body of the instrument makes a good handle for this *scraper*.

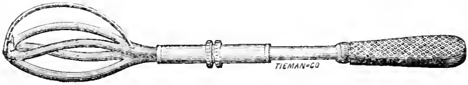
Third, a spring is adapted which may be employed to conduct a chain saw; whenever it may be desired to introduce it. The flat end of the instrument, armed with the *spring conductor*, is first passed under and around the bone or other part, when the spring is to be pushed along, until it can be seized by fingers or forceps. The chain saw, or a ligature, previously attached to the free end, can then be drawn along the groove in the body of the instrument, seized, and detached, after which, the retractor with its spring conductor, can be withdrawn together; or, as soon as the spring conductor is first seized, it can be held, while the retractor can be withdrawn, leaving the spring conductor in place; after which, the chain saw, or ligature, can be drawn into its position, by attaching it to either end of the spring conductor.

With such an instrument, put up in every amputating and exsecting case, it is believed, that it will be found to be a very important addition, to the surgeon's armamentarium.

II. It had often occurred to the writer, that the conveniencies and securities of the tenaculum and of the forceps, in seizing and holding arteries, should be combined, so as to make an instrument more convenient and more secure than either alone.

This *tenaculum forceps* (Fig. 2) is the realization of that desideratum. The instrument is represented as closed. It is first, a fenestrated forceps, the upper blade turning upon a hinge which is concealed in the figure, by the slide in the central part of the instrument. By this hinge, the upper blade turns over, nearly upon the handle. It will do this as soon as the slide is drawn toward the handle, impelled by a spring which is concealed in the figure. When the upper blade of the forceps is turned over upon the handle, the instrument is a tenaculum, having a point or hook projecting from the extremity of the stationary lower blade. The instrument in this condition is applied to a bleeding artery like an ordinary tenaculum. The upper blade is then pushed down upon the lower, and retained by the slide. The instrument then acts the part of tenaculum and forceps combined, and the blades are made wide enough to stop the bleeding from any artery smaller than the upper femoral.

Fig. 2.



When the artery is secured by this instrument, the blood is arrested at the same time, so that it is a question of convenience whether the ligature or an acupressure needle shall be immediately applied. The compression of a small vessel between the blades of the instrument for a little time, while the remainder of the operation is progressing, will often permanently arrest the hemorrhage. For the greatest convenience to this end, several instruments of the same kind should be at hand.

It will be observed, by looking at the figure, that the tenaculum point is protected by a guard, which gives two fenestræ to the upper blade. This is done for the convenience of applying a ligature. When the noose of the ligature is over the largest swell of the blades of the instrument, it is only necessary to draw upon it, and it slides to its position without any possibility of catching upon the point.

The writer has put the instrument to the test of several years' use with increasing appreciation of its value. There is but one drawback to the instrument. It is impossible to have it of such a size as to be a practical working instrument, and have a *pocket-case* instrument at the same time. As it exposes neither points nor corners, however, it may very conveniently be carried in one's pocket ready for use at any time.

ART. XIII.—*Reduction of an Inverted Uterus of Seven Months' Standing.*

By THOMAS ADDIS EMMET, M. D., Surgeon to the State Woman's Hospital, New York. [Read before the New York Obstetrical Society, Nov. 21st, 1865.]

MRS. Q., aged 24, came under my charge Oct. 8, and presented the following history: She had menstruated for the first time at eleven years of age, with no return for a year, but after this period she became regular and continued in perfect health. She was married at 22 years of age; soon afterwards became pregnant and went to full term. Labour commenced between the hours of nine and ten P. M., March 11, 1865. She was attended by a homœopathic practitioner, who was called in attendance at once and remained all night. The progress of the labour, it seems, was perfectly natural. About eleven A. M., the attendant ruptured the membranes, and delivery took place of a large male an hour afterwards, labour having continued nearly thirteen hours. As the head passed the vulvæ, it was discovered that the umbilical cord had made several turns around the child's neck; the cord, as stated, was immediately slipped over the head without traction, the body followed immediately, and soon afterwards the placenta. Within an hour after delivery the patient suddenly became faint, with violent after-pains coming on. This condition continued for some forty-eight hours, with a bloody discharge, which, at the time of a pain, was expelled from the vagina with considerable force. After the pains had ceased, the discharge continued more than natural, and at times was almost pure blood About a week after delivery the nurse discovered a mass presenting just within the vagina. An examination was made by the attendant, a consultation called, and the case pronounced (as the patient states) one of cauliflower-growth. She returned home to her friends, in Utica, at the end of the month, still suffering from a constant sanguineous discharge. Her general health at length became so much impaired that Dr. McCall, of Utica, was consulted, and he recommended her to my care.

She presented every indication of suffering from extreme anæmia, with a pulse of 140, and a loud cardiac murmur following any exertion. On making a vaginal examination, a soft mass, somewhat larger than an egg, was felt lying in the axis of the vagina, and, being pedunculated, might well have been mistaken for a polypus. I passed two fingers of the left hand well up into the cul-de-sac, behind the mass, so as to lift the uterus above the pubes, and, with the other hand over the abdomen, I was able to approximate the two sufficiently to satisfy myself that the case was one of inversion of the uterus.

Oct. 9. Dr. Thomas saw the case in consultation and verified my diagnosis. It was then decided that nothing could be gained by further delay.

10*th*. With a pulse of 160 per minute, she was placed under the influence of ether, at 12.30 P. M., by my assistant, Dr. Perry. As it was a serious question if, in her reduced condition, the anæsthetic could be continued long enough to effect the reduction, I requested Drs. Thomas, Sabine, and George T. Elliott to aid me with their counsel. After a few moments she was fully under the influence of the anæsthetic; the pulse became fuller and reduced in frequency. The patient was placed on the back, with her knees drawn up and lying on a table, of a convenient height for me to operate while seated. The left hand was passed entirely within the vagina, and by pressure of the fingers the fundus was dimpled, while the organ was steadied by the right hand over the abdomen. At the end of an hour I found that but little progress had been made beyond the fact that the fundus was somewhat smaller, in consequence of the impaired circulation from pressure. As there was full time for reflection, it became evident to me that the mode of reduction recommended by pressure made at the fundus was incorrect. As the fundus was indented by pressure, the body spread laterally, and, although it did materially dilate the neck by flattening it, the power was lost, without influencing to any extent the point of constriction. In fact it seemed if any force was exerted, it was to increase the difficulty by rolling in the parts above at the point of inversion. With this view I allowed the fundus to drop into the palm of my hand, and passing the thumb and fingers around the mass as high up as possible within the cervix, I made steady upward pressure with a view of returning first the portion last involved. This manœuvre was aided by lifting the organ above the pubes, and endeavouring with the other hand to roll out the inverted portion by sliding the abdominal wall over the point with some pressure. In the course of half an hour, the progress of the reduction was marked. The globular mass, which was felt through the abdominal parietes in the beginning, now gradually became oval laterally, with a marked depression in the centre. By this time my hand had become almost powerless, and I was obliged to call on Dr. Elliott to relieve me for a few moments. I then continued the manipulation for some three-quarters of an hour longer, when Dr. Thomas, who had been absent during the past hour, returned. From his appreciation of the progress made, the only fear I entertained of final success was in the patient's power of endurance. Gradually the fundus passed entirely within the cervix, but beyond this point, for an hour longer, but little advance was made in the reduction. The depression, however, felt through the abdominal walls, above the seat of inversion, had become large enough apparently to admit the extremities of three fingers, with a proportionate increase in the size of the mass. During the whole time the patient had been kept profoundly etherized by Dr. Perry. This was found necessary from the fact that in the beginning, when its influence was lessened to any degree, vomiting came on immediately, and with any movement of the patient it was impossible to steady the uterus or maintain the necessary amount of pressure. Her pulse had continued good throughout, and her general appearance was satisfactory. Shortly before four o'clock she began to fail; at about ten minutes after that hour her condition had become critical, and I was obliged to abandon my efforts for the time being, in consequence of the powerless condition of my hands. In consultation, the opinion was unanimous that it would jeopardize the life of the patient to continue the etherization longer. In this opinion Dr. Echeverria, who was present, concurred. At my request a last effort was made, for I was satisfied that I could not be deceived in the fact that the depression, felt through the abdomen, was slowly becoming larger. Drs. Sabine and Elliot, after a few moments, desisted from their efforts, as the latter gentleman had advised a frequent change, so that the hand of each operator having rested, the power exerted would be maintained in a more uniform manner. Dr. Thomas in turn also passed his hand into the vagina, and, as he describes it, he drew down the mass so as to reproduce the inversion, and on immediately returning it, he found that it did so beyond its previous position; he repeated this manœuvre, and on returning it again, on the point of his finger (without force on his part, as he stated), the fundus passed on and the reduction was completed, after an effort of three hours and fifty-five minutes.

This point is one of great clinical interest, and worthy of discussion by the Society, as to the bearing of this manœuvre on the result, as well as the exact point at which it should be resorted to. My own impression is that Dr. Thomas is mistaken as to the extent of reduction made by him. The portion below the constriction was flaccid and could be readily drawn down, but above the engaging point, where the surfaces were forced into such close proximity, it is a question if more force would not have been required to reproduce the condition existing at the beginning, than it was possible to have exerted. The final effort, doubtless, hastened the issue, yet as the widest portion of the uterus was already so far advanced within the canal, it is possible that the muscular action of the organ itself might have at this stage soon completed the reduction, as, from the result, the canal was evidently already dilated sufficiently for the purpose. We see the principle demonstrated in an India-rubber ball which has been indented; as soon as the action of recovery has once commenced, the progress of restitution rapidly increases to the consummation.

She speedily recovered her consciousness after the ether, and during the vomiting following, as a precaution, I passed the index finger directly into the relaxed canal of the uterus, which was presenting immediately within the labiæ. It was fortunate that I did so, for on the instant I felt a portion of the posterior wall near the fundus indented. With the other hand on the abdomen, I seized the organ and restored the portion on the point of my finger, and retained it in the canal until the paroxysm had passed. It was the only effort at vomiting, and there was no return.

At 5 P. M., with a pulse of 130, twenty-five drops of Magendie's solution of morphia was administered with beef-tea by the mouth. At 9 P. M., pulse 128, as she was suffering from pain generally over the abdomen, thirty drops of Magendie's solution was repeated. She was sleeping quietly at 10.30 P. M.; pulse 112 per minute. At midnight the pulse was 108, and she had been sleeping since the last visit.

11*th.* At 9 A. M. the pulse was 110; she was free from pain, and had passed a quiet night. As there was some tenderness on pressure over the abdomen, a large poultice was ordered. At noon her condition was comfortable; pulse 120, with some increase of tenderness over the abdomen;

ordered the morphia to be repeated. Half past two P. M. was free from pain, and sleeping quietly; pulse 105. At 7 o'clock P. M. pulse the same; repeated the morphia.

12*th*. 9 A. M. pulse 100; she was entirely free from pain, and had passed a very comfortable night. From this time she was kept quiet in bed for twelve days without any further treatment being necessary.

16*th*. I made a digital examination and found the os patulous, but the uterine canal contracted above the vaginal junction so as to admit the point of the index finger only for a short distance. The sound passed a little over three inches readily to the fundus, with the organ somewhat anteverted.

Nov. 28. She visited me after taking a long drive. I found the uterus had returned nearly to its normal size. She had menstruated naturally a few days before, and was rapidly regaining her health and flesh.

After presenting the case to the Society, Dr. Budd remarked that Dr. Noeggerath had some years ago succeeded in reducing an inverted uterus by a similar process, and that the case was published in the Transactions of the Academy of Medicine.[1] Dr. Noeggerath being called on, related the case in full, and remarked that in recent cases, and where the fundus had not yet escaped from the cervix, the dimpling process recommended would sometimes succeed, but not always where the inversion was complete. He also gave the particulars of a subsequent case where he succeeded only by confining his manipulations entirely to the return of one side alone, until the reduction was complete. It was the opinion of some of the other members that the condition of the patient, at the point in question, favoured a rapid reduction in the last stage, and as the dilation was complete, the innate force of the organ itself might have soon completed the reduction.

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[1] This paper was read before the Academy of Medicine, March 5, 1862, and published in the *Medical Times*, New York, April 26, 1862. Since reporting the case, I have read the article for the first time, and with great interest. But the method employed by myself was entirely different. I grasped the circumference of the mass as near the seat of inversion as possible, and, by upward pressure, the extremities of my fingers acted as a wedge laterally to roll out first the portion last inverted. And, in addition, the manœuvre was facilitated in a great degree by the action of the other hand over the abdomen.

Dr. Noeggerath's case was of thirteen years' standing. He first resorted to the method proposed by Prof. White, of Buffalo, but without success, and states in his paper as follows: "Almost discouraged by these fruitless efforts, and feeling that the strength of my right arm was nearly exhausted, I was about to desist from any further attempts, when the idea struck me to proceed on a different plan of manipulation. I at once changed the position of my hand in such a manner that the fore and middle fingers grasped the right section of the tumour; while the thumb was implanted on the left side at a point where the upper two-thirds of its length met the lower one. In this manner a pressure was exerted by the thumb on the lateral border of the body of the womb, which pressure took an upward as well as a lateral direction, and resulted in the formation of an oblong groove, the long diameter of which pointed below towards the left horn of the uterine fundus, and upwards to the spot where the inverted and the non-inverted portion met on the left side. The object of this first step of the operation was to completely double up the uterine cavity, so that the right—now inner—wall touched the left one. After this was completed, the dimpled portion was carried upwards by the thumb, and in doing so it could be observed that the right side of the upper section of the inverted cervix passed first of all through and beyond the os uteri. During the progress of this manipulation, the right lower section of the uterine body followed, and reassumed its normal position, while the opposite part of the fundus continued to remain outside the os, only much shortened and doubled up. As soon, however, as half of the tumour had disappeared inside the abdominal cavity, the intra-vaginal section slipped suddenly out of my fingers, and the operation was completed."

TRANSACTIONS OF SOCIETIES.

Art. XIV.—*Summary of the Transactions of the College of Physicians of Philadelphia.*

1865. *April* 5. *Mammary Cancer.*—Dr. John Ashhurst, Jr., presented a specimen of cancer of the breast which he had removed from a patient in the Episcopal Hospital. She was a married woman, 62 years of age, and had suffered from the affection for which she was admitted for not less than 15 years. During the last 18 months her pain had been so acute and constant that she was exceedingly anxious for an operation, though fully understanding that the relief which it promised could in all probability be merely temporary. The tumour was seated in the upper part of the left mamma, involving a portion only of the gland, but extending into the neighbouring tissues, being adherent to the skin, and likewise to one of the costal cartilages and the adjacent intercostal muscles. Two glands in the axilla were much enlarged and indurated, and there were one or two tubercles detached from the principal mass and excessively tender to the touch. The most adherent portion of the tumour was ulcerated to the extent of about an inch square, and from this surface occasional hemorrhages took place. The patient was extremely feeble, and exhausted from pain and loss of sleep.

Ether having been freely administered, an incision was made of a somewhat oval form so as to include all of the diseased integument; it was afterwards found necessary to extend it considerably so as to remove the diseased axillary glands. The tumour was removed as much as possible by tearing instead of cutting, the healthy portion of the gland being, however, allowed to remain. Four ligatures were required; two of them to the cephalic vein, which was divided in removing the axillary glands. The edges of the wound were approximated without much difficulty by means of silver and lead wire sutures, and supported by broad strips of adhesive plaster. The patient reacted but slowly from the effects of the ether, and for a few days suffered a good deal from dyspnœa; a chronic catarrhal affection, under which she laboured, having been aggravated by the irritating vapour.

The incision rapidly healed, to a great extent by adhesion, and the patient's constitutional condition improved in an equally satisfactory manner.

About a week or ten days after her discharge from the hospital, however, she applied for readmission on account of agonizing pain in the right leg. It was now found that the tibia had become greatly enlarged, and acutely sensitive to the touch. She stated now, which she had never mentioned before, that some months previously she had struck her leg against the bedstead, and that she had had some pain in walking ever since, though she had paid but little attention to it till she had left the hospital, her mind being occupied by the condition of her breast. Malignant disease of the tibia was diagnosticated, and, as it had advanced very rapidly during the preceding three or four days, she was advised to submit to an amputation as a means, if not of prolonging life, at least of alleviating her present suffering. She, however, positively refused the treatment proposed, and, of course, left the hospital.

The excised mammary tumour was microscopically examined by Dr. Packard, and found to present the usual multiform cells, some containing several nuclei, and many containing numerous nucleoli.

May 3. Dr. PACKARD made a verbal communication on the subject of Anæsthesia, as follows:—

My attention was attracted a few days since by an article, from the pen of Dr. Lente, of Cold Spring, N. Y., published in the last number of the *New York Medical Journal*, and entitled "Sulphuric Ether *versus* Chloroform." In that article Dr. L., who is well known as an advocate of the use of ether by his writings in various periodicals, says: "This fact I regard as settled—that a patient may be brought under the influence of sulphuric ether as quickly as he can safely by chloroform, and with a quantity costing less, and weighing but little more than the requisite amount of the latter; the objection, then, sometimes raised by army surgeons, of increased trouble of transportation, is not tenable.

"If any doubt this fact, after referring to the statistics above alluded to,[1] *I will agree to go to any hospital where a large number of operations are being performed, and demonstrate it to the satisfaction of the opponents of ether.* * * * *

"The recently published report of the Royal Medical and Chirurgical Society of London, adverse to the employment of sulphuric ether, and the recent occurrence of so many additional cases of death from chloroform poisoning, have forcibly recalled my attention to this subject, and, at the risk of a charge of egotism, induced me to make the offer which I here repeat; in other words, that is, to guarantee to get a number of patients, in any hospital, under full anæsthesia with sulphuric ether in as short a time as can safely be done with chloroform, and with a quantity not exceeding an average of two ounces and a half, the average time two minutes and a half. The average time and quantity would probably be less in the ordinary run of hospital cases (not more than half as much in cases of considerable debility, and after hemorrhage or insufficient nourishment, as in many cases in military surgery)."

Until the fall of 1864 I had been in the constant habit of administering chloroform for the purpose of inducing anæsthesia, and in hundreds of cases had never seen any injurious effect from it. My reason for preferring it to ether was the greater facility of carrying it, the very much smaller quantity required, and the more agreeable character of its influence. A case which occurred then, however (reported by me to the College, and published in the *American Journal* for January, 1865), in which death was imminent, and averted only by the prompt use of an electro-magnetic battery, shook my confidence; and it was shortly followed by another, in which death actually took place, at the Beverly U. S. A. Hospital.

Another case has very recently occurred to me, in private practice, in which chloroform, given to a patient already nearly insensible from ether, was productive of alarming symptoms.

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[1] Given by Dr. Lente in the American Journal for April, 1861, in the American Medical Times, June 28, 1862, and in a Report of the Committee of the Boston Society for Medical Improvement, published in 1861.

Dr. Lente's statements, as before quoted, led me to write to him to inquire as to the method of administering the ether, in order to obtain the effect in so short a time, and with so small a quantity of the article. His answer to my question is contained in the following extract from his letter :—

"All you want for the efficient administration of ether, after procuring a pure article (and Squibb's I prefer to any other), are stiff paper and a rather stiff and thick towel, if one can be had—if not, any will do. I usually take a newspaper —as that is to be had in every house—fold it, so as to make it about eighteen inches long and seven to eight broad; fold the towel so as to correspond, lay one on the other, fold them so as to form a cone, with the *towel inside*, and pin them securely, especially the edges of the towel inside, so that it will not fall on the face and annoy the patient. The apex of the cone must be folded tightly, so that *no air* can enter. If the cone is rather elongated, I stuff a white handkerchief tightly into it, so as not to have its capacity too great. You see the great object is to have the vapour *as concentrated as possible*, just the reverse of what is safe with the vapour of chloroform. The patient being all ready, I explain to him fully how to inhale the ether, and the unpleasant symptoms which he will probably experience at first, assuring him of the perfect safety of the process (which cannot be done in the case of chloroform). I then have some one take hold of his hands quietly, so as to be ready to arrest any sudden movement towards tearing away the inhaler from the face, and other assistants to look out for other violent movements, so that the process, when once commenced, shall not be interrupted for a moment. I then pour on, from a three or four ounce bottle, with not too narrow a mouth, about a drachm or two of ether (if I am anxious to use as little as possible), if not a little more, until I ascertain the capacity of the patient for breathing it; if he does not cough or strangle, I put it in close contact, taking care always not to press in the sides of the cone, so as to encroach on its capacity, holding it with *both hands*, near its edges, and pressing them pretty firmly, at all points, against the face. If he persistently hold his breath, as patients occasionally do, or strangle in any considerable degree, I remove it *slightly* from the face for a moment. In a very short time, I throw on an ounce more of ether, and then keep the inhaler in close contact with the face; this is repeated, scarcely ever using more than three or four drachms at each fresh application, until the etherization is effected. A very important point, and one most generally neglected, is to keep the inhaler away as short a time as possible when replenishing the ether, *throwing it on*, and not deliberately pouring it on, as I usually see done. As long as the patient retains consciousness, if he does not follow my directions with regard to full and rapid inspirations, I now and then call loudly, in his ear, *breathe strongly!* No matter how hard his struggles are, after he has commenced to breathe fully, I never 'let up,' but keep the cone remorselessly pressed against his face, and ply him still more strongly with the ether. This must be especially attended to in the case of all children, for with them it is generally a struggle from the beginning, whether ether or chloroform be used, and it is neither necessary nor practicable to get their confidence so as to ease them with the inhalation, as I have described above in the case of adults. Their cries and consequent full inspirations cause them to succumb very rapidly.

"By following these directions you will, after a little practice, etherize your patients as quickly and with as little trouble as you can safely chloroformize them—that is, in from three to four minutes (average), and with from one and a half to two and a half ounces of ether. But if you choose to use from *two to three* ounces of the drug—and more than the latter is almost never necessary—you may shorten the time by a minute. I speak of comparatively robust adult subjects; with feebler, less time and less ether are required. It is better to have no current of air about the patient during the process, if possible. It is important to be fully impressed with the fact that there is absolutely no danger of death from *too sudden action* of the ether, otherwise we will not give it with sufficient confidence to insure a prompt result. The little danger attaching to ether is from *prostration*, which always occurs after the operation is over, and the patient has recovered his consciousness. I have, in several communications, insisted that the pulse should be watched for a time after the administration of ether, especially in delicate subjects, or if there are any indications of extreme debility. I have had, and have published several cases of severe prostration succeeding etherization, but I have never seen any case where I could get a patient too suddenly under the effect of sulphuric ether. It is not surprising that when the manner of administering the two agents is so entirely different, those who have generally been in the habit of using one, should fail when attempting to employ the other, until they have become thoroughly accustomed to it. I gave ether a short time ago to myself, in the hospital at West Point, unassisted, and became completely insensible with half an ounce, so as to be unconscious of the extraction of a molar tooth by the hospital steward, Mr. Saunders. A few days after, with a four ounce bottle of ether. I etherized three patients, from whose jaws the steward extracted at least forty teeth in the aggregate, and used only about three-fourths of the contents of the bottle. As regards the *nausea* and *vomiting*, referred to in your letter, if no food be taken for four or six hours before the operation, there is seldom any trouble worth mentioning. It is usually well to give a little brandy and water or a glass of wine before the operation, especially if the subject be feeble. And in case of severe operations, if much prostration supervenes, I give an enema of brandy and water. I have thought for some time of having an inhaler constructed of silver wire network, with a cone of woollen over it, and some impervious material over that, as suggested by my friend Prof. T. G. Thomas, but I succeed so well with the extemporized apparatus above described, that I have not yet had it done."

I have not yet had an opportunity of trying this method of administering ether, but, from what I know of Dr. Lente, I am inclined to place great confidence in what he says. It is very doubtful whether we ever obtain any other anæsthetic agent at once so safe and so efficient as sulphuric ether; we certainly have not found any such as yet. If, therefore, we can improve upon the methods now generally in vogue for its administration, we shall do well to prefer it to its more dangerous rivals.

July 5. *Report on Meteorology and Epidemics for the year ending Jan.* 1*st*, 1865. Dr. James M. Corse presented a report, of which the following is an abstract:—

The meteorology of Philadelphia for the past year has not been marked by any striking variations from the usual phenomena. The temperature has departed from that of the preceding year by only a slight variation.

The following table will give the maximum, minimum, and mean temperature, monthly, for the year 1864:—

	Maximum.	Minimum.	Mean Temp.
January	64.	9.50	33.28
February	58.	5.	35.97
March	58.	22.	40.50
April	75.50	34.50	50.58
May	85.50	44.	67.20
June	99.	65.50	72.
July	93.50	77.	76.08
August	96.	73.	79.40
September	80.	50.	65.
October	76.50	39.	54.75
November	69.50	25.	45.80
December	60.	12.	36.77

The mean temperature for the year was 54.77° Fahrenheit.

Rain and Snow.—The fall of rain and snow during the year 1864 has been a little more than three inches less than the year 1863.

The following table will give the monthly distribution of the rain and snow for the last three years:—

	1864. Inches.	1863. Inches.	1862. Inches.
January	1.705	4.720	4.795
February	.551	4.680	4.640
March	5.170	5.885	3.553
April	3.795	7.015	4.160
May	8.685	4.510	2.308
June	2.345	4.250	6.975
July	3.770	6.009	2.462
August	1.920	1.447	4.925
September	7.165	0.875	2.980
October	1.820	2.465	4.770
November	3.930	2.700	4.740
December	5.145	4.633	1.650
	46.001	49.189	45.008

Epidemics.—On this subject we can have but little to say for the year 1864. The good climate and favourable hygienic circumstances of Philadelphia exempt us, in a great degree, from epidemics at all times, and when they do prevail it is not common for them to be violent in their effect, or of long duration. Of epidemics not enough is known to enable us to speak with precision, and without occupying your time with speculations upon the cause of them, upon the nature and mode of operation of the morbific agent, or what forms the constitution of the atmosphere within any given period or season, we may say, with propriety, we think, that the epidemic constitution of the atmosphere in the first quarter of the year was such as to incline all diseases to a low grade of action corresponding to the fourth epidemic constitution of Hippocrates. It improved a little for the second and third quarters, but was again very strong in the fourth quarter. The first and second quarters were very damp, with prevalence of febrile diseases, corresponding to the autumnal constitution of Sydenham, this constitution was much more strongly marked towards the close of the year. It will be remembered that the winter of 1863–64 was mild, so much so that we failed to get a supply of ice for summer use; the spring was cold, wet, and late, and we noticed that the growth of cryptogamous plants was more luxuriant than usual; the northern exposure of walls, and the bark on the north side of trees were covered, near the ground, with mono-cellular algæ, particularly the chlorosporeæ; fungi, lichens, and mosses were also more abundant than usual.

These facts, and others of a similar kind, would allow us to suppose that other and lower forms of vegetable growth were produced in greater abundance than usual, and help to sustain those hypotheses which attribute epidemic diseases to a vegetable origin.

The same facts may also be used by those who suppose epidemics to have an animalcular origin, for many species of the well-known lower forms of life are classified by zoologists among animals, while botanists claim them for the vegetable kingdom.

No disease has prevailed in Philadelphia during the year 1864 to which the term epidemic could be properly applied.

A quasi-epidemic has prevailed to which some give the name of spotted fever, others cerebro-spinal meningitis, others, again, malignant fever, etc. etc.; it seems to be a disease with diverse symptoms, all of an adynamic character, which are best treated by tonics, stimulants, and nourishing food.

Under the head of spotted fever 240 deaths have been reported to the Board of Health for the year 1864; 49 for 1863, and none previously.

Typhus has prevailed to a considerable extent, but it can hardly be called epidemic; yet there has been a gradual increase for the last three years, as the following statement will show:—

Deaths from Typhus.

1862.	1863.	1864.
37	131	335

In 1864 the deaths were, quarterly, as follows:—

1st Quarter.	2d Quarter.	3d Quarter.	4th Quarter.
168	70	45	52

The disease made its appearance in the female department of the County Prison in November, but was, by the timely, judicious and energetic measures, arrested without a death, after attacking 15 prisoners, two convicts, and five untried, and many of the officers of the Institution.

The whole number of deaths in Philadelphia for the year 1864 is 17,582. This includes the entire city in its present extended limits.

This number is 1,794 greater than that for 1863. The causes for these deaths, registered at the Health Office, amount to 275 in number. A very large majority, however, were occasioned by comparatively few causes. Consumption of the lungs alone having occasioned 2,089.

Subjoined is a table of 36 causes, which account for 14,607 deaths, leaving only 2,975, for which a long list of causes are assigned.

The following table presents a carefully compiled list of deaths, showing the comparative mortality from their causes for the last four years.

Causes.	1864.	1863.	1862.	1861.
Apoplexy	181	194	176	162
Casualties	178	120	135	122
Convulsions	736	681	703	630
Croup	455	444	258	304
Congestion of the brain	440	421	324	275
" " lungs	172	183	147	110
Consumption of the lungs	2,089	1,955	1,949	1,817
Cancer	180	140	181	189
Cholera infantum	641	930	622	611
Diphtheria	357	434	325	502
Dropsy	224	225	236	284
" of the brain	218	225	200	202
Disease of the heart	345	305	242	260
" " brain	99	103	98	112
Diarrhœa	454	315	417	183
Debility	756	926	940	826
Dysentery	249	176	163	157
Drowned	133	131	135	99
Fever, scarlet	349	275	461	1,190
" typhoid	648	486	654	281
" typhus	335	131	37	45
" spotted	240	49	...	...
Gunshot wounds	366	310	292	20
Hooping-cough	87	78	208	93
Inflammation of brain	440	386	365	305
" " bronchi	185	122	116	138
" " lungs	929	743	749	681
" " stomach and bowels	289	267	306	231
Inanition	219	129	125	124
Marasmus	598	606	643	533
Measles	90	82	109	74
Old age	278	234	219	203
Palsy	172	201	164	159
Smallpox	260	171	264	758
Stillborn	788	743	711	630
Unknown	427	112	97	104
	14,607	12,815	12,771	12,458

The aggregate monthly mortality is exhibited in the following table, which is interesting as showing the effect of vicissitudes of the weather on the general health of the whole population :—

January	1,302	August	1,956
February	1,434	September	1,251
March	1,894	October	1,144
April	1,377	November	1,212
May	1,529	December	1,595
June	1,245		
July	1,643		17,582

The following table of deaths of soldiers, in military hospitals, amounting to 1,598, is very interesting in showing what sort of diseases are engendered or aggravated by camp life :—

Interments of Soldiers.

Albuminuria	1
Asthma	1
Abscess	3
Accidents	22
Asphyxia	1
Aneurism of the aorta	1
Apoplexy	6
Anemia	1
Amputation	1
Cancer	1
" of the stomach	2
Cholera	1
" morbus	1
Congestion of the brain	12
" " liver	1
" " lungs	7
Coup de soleil	2
Croup	2
Consumption of lungs	122
Cerebro-spinal meningitis	6
Convulsions	2
Concussion of the brain	1
Compression of the brain	6
Dropsy	7
" of the chest	1
" of heart	3
" of lungs	1
Disease of stomach and bowels	1
Disease of brain	1
" of kidneys	2
" of heart	10
" of liver	1
Drowned	6
Diarrhœa	214
Dysentery	22
Debility	22
Diphtheria	15
Erysipelas	15
Enlargement of heart	1
Epilepsy	6
Empyema	4
Exposure	1
Fever, typhoid	183
" lung	1
" typhus	12
" intermittent	2
" bilious	1
" remittent	1
" traumatic	1
" yellow	1
" hectic	1
" scarlet	4
" catarrhal	1
Fever, congestive	2
" camp	1
" nervous	1
" malignant	1
" spotted	4
Fatty degeneration of heart	2
Fracture of skull	1
" of thigh	5
Gangrene	8
Hemorrhage	20
" from bowels	2
" from lungs	4
Hernia	1
Inflammation of lungs	135
" of brain	17
" of bronchi	12
" of heart	2
" of peritoneum	6
" of stomach and bowels	18
" of larynx	1
" of tonsils	1
" of pleura	12
" of veins	2
" of liver	3
" of spine	1
Inanition	66
Insanity	2
Jaundice	3
Murder	4
Measles	6
Mania-a-potu	16
Mumps	1
Marasmus	2
Ossification of heart	1
Palsy	3
Pyemia	59
Rheumatism	3
" of the heart	2
Suicide	1
Softening of brain	2
Scrofula	1
Shock	1
Smallpox	19
Sore throat	1
Syncope	1
Tetanus	7
Unknown	33
Ulcers	1
Ulceration of stomach	2
Wounds, gunshot	355
Total	1,598

Oct. 4. Cancer of the Ascending Colon. Dr. ALFRED STILLE reported the following case of this :—

In April, 1864, I was asked to see Mr. X. He was 52 years of age, had been for twenty years or more a bank clerk, and in his habits was most methodical and exemplary. His constitution was naturally somewhat delicate, and his person slender; his complexion was clear, and neither pale nor florid. His father died of stone in the bladder; and a sister, and, if my memory serves me, his mother also, of cancer. Since childhood he had been subject to attacks of diarrhœa, apparently from food disagreeing with him; but his appetite and gastric digestion had always been excellent. He had never suffered any serious attack of acute disease. During the last ten years he had been subject to neuralgia of the left sciatic and crural nerves, which was much relieved by the interrupted galvanic current.

In 1861 he experienced a severe attack of diarrhœa, and afterwards continued to be more liable to it than previously; for the last few months before my visit the stools had been very frequent, and his flesh and strength declined. I found him pale and thin; his pulse 65, and feeble; without cough or heart symptoms; his appetite and digestion good. The abdomen presented a natural aspect, and was everywhere indolent except between the umbilicus and the right flank, where, within a space of about two or three square inches, there was tenderness under pressure and a sensible hardness. Under the use of suppositories containing opium and strychnia the diarrhœa ceased, and a diet consisting exclusively of milk, cream, butter, farinaceous articles, and meat essence was strictly enjoined. The improvement was such that Mr. X. was shortly enabled to partially resume his duties at bank.

During May and June, 1864, however, a very steady but gradual loss of flesh occurred, and the complexion acquired a pale straw tint. The stools were usually of a natural colour, and consisted of small, hard, rounded masses, with more or less mucus, or else of narrow cylindrical pieces; but sometimes they were formed principally of mucus, and were voided with pain. There was a good deal of vesical irritation, requiring the patient to rise frequently at night. This symptom was relieved by lime-water. As the summer advanced, the tumour became more palpable, not so much on account of its own growth, as because the integuments grew thinner. Still, its mass was certainly greater, and estimated as measuring two by three inches in diameter. The least departure from the prescribed regimen, and especially the use of solid food, even in very small quantities, occasioned pain and tenderness in the tumour, and diarrhœa, which was usually checked by acetate of lead and opium. During July, on one occasion a small piece of rare beef was eaten for dinner; the same night severe pain was felt at the seat of the tumour, which was of an intermittent character, and the swelling itself largely increased. These symptoms were very severe for eighteen hours, when they suddenly ceased, and the tumour subsided to its ordinary dimensions. Two stools followed, which were of a natural consistence. About a week afterwards a similar attack occurred. On this occasion the abdomen was distended and resonant; and, although not tender, it was the seat of constantly recurring paroxysms of severe pain, extending throughout the belly, but most violent at the seat of the tumour. The pulse became thready, the extremities cool, the features pinched, and there was hiccup with occasional retching, and the rejection of a greenish liquid. Fomentations with spirit of turpentine and the administration of repeated doses of calomel, extract of hyoscyamus, and creasote allayed the vomiting, palliated the pain, and at last produced an alvine evacuation, and the complete subsidence of the abdominal distension, and of the pain. For several days afterwards the tumour swelled visibly and palpably if it was handled, causing at the same time a slight colicky pain.

From this time there was less suffering. In the month of August the feet began to swell; but the muscular strength improved as well as the appetite, and the patient walked or rode out daily; and by the end of September had gained five pounds in weight. He resumed his duties at bank. At the end of October he had general but slight anasarca, which was most conspicuous in the feet. The urine contained no albumen, showed no sediment, was acid in its reaction, and had a sp. gr. of 1.018. In November a mild spontaneous diarrhœa caused the evacuation of nearly all the dropsical effusion, after which the strength improved so far that, although with some difficulty at first, the patient went to his office to transact important business. For three months afterwards he did not require any special attention, but continued to perform his duties, although he suffered inconvenience from the renewal of the dropsy, especially in his lower limbs.

I was called once more to visit him about the end of March, 1865, when the effusion was undergoing a rapid and spontaneous discharge by the kidneys, occasioning a good deal of prostration. There was no pain nor diarrhœa, and the appetite was good. The skin was paler, and the veins more pinkish; the urine normal. It may be mentioned here that the patient had all along been taking one or another preparation of iron; cinchona, usually in the form of tincture, and more or less wine or whiskey according to his appetite and strength. These tonics and stimulants now became more necessary, because his tissues were evidently wasting and his blood growing more watery. An additional proof of the last statement consists in the soft blowing murmur which now began to be heard in the heart, and in the great arteries of the neck, and which thenceforward grew louder and more shrill. Furthermore, hurried palpitation of the heart, with a sense of constriction at the præcordia, was induced by all muscular efforts and every lively emotion of the mind.

From this time a gradual and steady decline of flesh and strength took place, notwithstanding the appetite continued to be good, and food sufficient for normal nutrition was consumed. No striking change occurred in the size, relations, or sensibility of the tumour; the bowels were regularly moved, and the stools of good consistence and colour, were generally more or less scybalous. As the flesh and strength wasted, the pulse gradually became more frequent, rising from 72 very slowly until it reached 96 and upwards, and also grew faint and thready. Towards the close of July diarrhœa was renewed without pain or abdominal disturbance of any kind; the stools consisting of a yellowish, thin, gruel-like, and very fetid substance. Finally, life slowly departed without the slightest struggle, on the 9th of August.

I was permitted to make an examination of the body, of which I availed myself so far as to inspect the abdominal organs and to secure the diseased part, which is herewith presented.

There was a small quantity of clear liquid in the cavity of the abdomen; but no vascular injection, no adhesion, nor other sign of peritoneal inflammation. The caput coli, appendix cæci, and ileo-colic valve were perfectly healthy, and for two and a half inches above the valve there was no trace of disease. From that point, and upwards, for a distance of three or four inches, the calibre of the colon was very much narrowed, at one place to such a degree that the end of the little finger could scarcely be passed into it. The mucous membrane itself, except a slight superficial abrasion, the one-eighth of an inch in diameter, appeared to be perfectly sound. But the remaining coats, for about one-half or two-thirds of the circumference of the colon, were lost in a mass of scirrhous cancer in the first stage of softening, and which became thicker towards the meso-colon, in which also the glands were enlarged and hard. No other secondary cancerous deposit was observed in the liver or elsewhere.

It is worthy of remark in this case that from first to last the cancer gave rise to no pain, except what was due to occasional obstruction of the bowels by solid food. It is also to be remarked that the appetite was always good, was often craving, and the patient's imagination dwelt willingly upon the good things he might eat and drink. Further, that in spite of a large quantity of food, especially of milk, bread, and other farinacea, with juice of beef, &c., emaciation was steadily progressive, and anæmia gradually, and at last in a remarkable degree established. This is the more noticeable when it is remembered that none of the organs concerned in primary absorption and assimilation were diseased, but only one whose chief office is excretory; and also that the loss of strength by diarrhœa or pain was very trifling. The case in question, then, may be regarded as tending to confirm the doctrine that the constitutional dyscrasia, much more than the local lesion, is the cause of decline and death in many cases of cancer.

My chief object, however, in presenting this case to the College is that its history and illustrative specimen may be preserved as an example of cancer in a very unusual situation. Cancer of the stomach, the rectum, the sigmoid flexure, the transverse colon, and the cæcum, are frequent in the order mentioned, but I have never seen an instance in which the ascending colon was the only part of the intestine involved, nor have I met with such an example on record. It appears to me that in this case the disease began in the meso-colon, and gradually embraced a portion of the intestine. This view is suggested by the greater thickness of the deposit in the meso-colon than elsewhere, the freedom from cancer of the colon opposite to its attachment, and the soundness of its mucous membrane in spite of so protracted a disease.

Regeneration of Bone.—Dr. HUNT reported that regeneration of the bone had taken place to a remarkable degree in the case of excision of the lower jaw for phosphorus-necrosis, in which the periosteum had been preserved, an account of which was published in the *American Journal* for April, 1865 (p. 353). The patient was introduced into the room, and examined with great interest by the Fellows of the College who were present.

Nov. 1. *Tumour on the Posterior Portion of the Tongue.* Dr. WM. HUNT reported the following case:—

Mary M., aged 16 years, was admitted into the Pennsylvania Hospital on account of a tumour situated on the posterior part of the tongue, and immediately in front of the epiglottis. The tumour was very large for the place that it occupied, and apparently completely filled the fauces, but on examination it was found that the neighbouring structures had accommodated themselves to its presence, for the velum could be readily raised from it, and the finger passed behind and around its posterior surface. The epiglottis could be felt also without difficulty, and, upon drawing the tongue forward and depressing it, the parts behind were seen to be entirely normal. All of the morbid growth could not be seen or felt, as it descended beyond the reach of the finger, and its size was not fully appreciated until it was operated upon. In every other respect the patient appeared to be perfectly healthy, and she applied for relief because the tumour was growing and becoming troublesome, interfering with speech and deglutition, and with respiration when in the recumbent position.

The history, as obtained from the patient, is as follows. Five years ago, during an epidemic of diphtheria, she felt some uneasiness in the throat. It was examined by a physician, and he then discovered a small tumour, about the size of a pea, on the middle of the posterior surface of the tongue. Nothing was done for it, and it continued to grow without giving rise to pain or even uneasiness, until it became nearly as large as when the patient was admitted into the hospital.

The surface of the tumour was very red, with large distended vessels coursing over it. There was no pulsation. It was quite elastic, and had an indistinct fluctuating character, but not decided enough to indicate fluid. The opinions as to its nature were various, but favoured the view that it was a hypertrophy of glandular tissue, and probably connected with the part known as the foramen cæcum, at the apex of the circumvallate papillæ.

An operation was decided upon, and it became quite a problem how to manage such an uncontrollable part. A peculiar tenaculum with a large curve was made, and into the shaft of this was fixed a sliding-piece of steel, with a catch to fit the point of the tenaculum. The object was to hook the tumour deeply, and after the point appeared on the opposite side, to push the slide forward where it would be held by the point of the tenaculum. The handle of the instrument was set at an angle with the shaft, so as not to interfere with the view or the manipulations. It was decided to try the ecraseur first, and, if this failed, ligation was to be resorted to.

The operation was performed October 7th, 1865. The patient was etherized, but in this state she was altogether unmanageable, as the tongue fell back, carrying the tumour with it; and as her own co-operation was necessary, she was soon freed from the anæsthetic, and held herself bravely during the operation. The tenaculum worked well, but the ecraseur was a failure, both on account of the small portion of the tumour that could be engaged by it, and the limited space to work it in. After several trials it was therefore abandoned, and by placing the finger behind the tumour, and by the use of the tenaculum, I was enabled to draw it so far forward as to bring its posterior surface in view. A large needle, armed with a double silk ligature, was then passed through its base, entering on the posterior aspect. The threads were cut so as to include both sides, and with the assistance of Dr. Agnew, a large mass was thoroughly strangulated. An incision was then made into it, and a small amount of a peculiar gelatinous-looking substance exuded, but there was no disposition to empty itself. This material was at once examined under the microscope, and its character agrees more with the adenoid or glandular variety of morbid growth than with any other form. The drawing of its appearance is herewith presented.

The patient was placed in bed. She slept tolerably well on Saturday night. On Sunday had some sickness of stomach, with vomiting. By night, had marked fever, pulse running up to 120. Experiences no particular difficulty from the tumour, but is very sensitive to light, and wishes the room darkened.

On Monday the same symptoms continued in a more aggravated form, but on inspection the mass of perfectly strangulated matter seemed sufficient to account for them, as they were in no wise different from those of a person having an ordinary sloughing wound. Acetate of ammonia and morphia were given, and also a mouth wash of permanganate of potash was used.

The patient was closely watched throughout. At 7 o'clock Monday evening, she said she felt better, and would like to sleep. She got on very well until one o'clock A. M., when she complained of *lightness in the head.* At 2½ o'clock she had a sense of smothering, but at 4 o'clock, after waking, she talked about what she would like to have for breakfast, and again went to sleep, having previously spoken of the peculiar sensations in her head. At 15 minutes of 5, Dr. Andrews, the resident in charge, was called in great haste by the nurse, who said that she could not arouse Mary, and that she had some difficulty in drawing her breath. The doctor found her in the following condition. Entire unconsciousness; respiration interrupted, two or three quick gasps, followed by a pause of at least one minute; lips blue; face livid; pulse small, quick, irregular. He thought the tongue had fallen back, and pulled it forward by passing the finger around the tumour, but did not hold it there, as there was no perceptible change in the symptoms. Œdema of the glottis had been all along the prominent accident in mind, and thinking there was trouble of this kind, the doctor at once performed laryngotomy, and inserted a tracheal tube. This had the effect of rousing the respiratory movements for a little while, but the patient soon fell into the same condition as before; I was sent for; arrived at about 6 o'clock, and found her in the following very peculiar state. Entire unconsciousness; head thrown back; eyes open, conjunctiva injected, pupils perfectly fixed, and of medium size. She would lie perfectly quiet for 58 seconds, timed by the watch, and during this time the pulse would become slow, and sometimes fall as low as 60 beats per minute, then would come two or three quick, jerking respirations, accompanied by the expulsion of frothy and bloody mucus from the tube. The blood was from the cut. The discharge had a very offensive smell. The quick respirations would soon subside, lasting only a few seconds, then there would be an interval of 58 seconds, again to be followed by the jerking respirations. During the interval the lips and fingers were livid, and this lividity would partially disappear while the respirations were going on, but they did not continue long enough, at any time, for the complete disappearance of it. Percussion was clear over the whole chest, and *during the respirations* the air could be detected permeating the lungs, the mucus only interfering with it, and producing the ordinary râles. Artificial respiration was resorted to, although to no effect, for the patient was evidently not dying from apnœa. Galvanism produced contractions of the external thoracic muscles in a perfectly normal way, without any influence on the condition. Strong ammonia, applied to the nostrils, produced facial contractions, but had no effect in arousing consciousness or stimulating respiration. Cut cups were applied to the back of the neck, but did no good. The anal sphincters were relaxed, and the rectum would not retain injections. Deglutition was not performed, as fluids placed in the mouth regurgitated, although on two occasions I thought I noticed an act like that of swallowing. These phenomena continued until 12 *minutes before* 9 *o'clock A. M.*, when death took place. Shortly before death the respirations were shorter and somewhat more frequent, and consciousness was totally absent, as it had been from the beginning of the serious symptoms.

Autopsy eight hours after death.—Rigor mortis well marked. Patient was menstruating at time of death. The membranes of the brain were very much congested throughout, but the cerebellar membranes and those of the medulla intensely so. The brain substance appeared to be healthy everywhere, both as to consistence and colour. There was no abnormal amount of fluid in the ventricles.

Thorax. The lungs were crepitant but markedly congested on the inferior and posterior portions. The bronchia contained a considerable amount of frothy and bloody mucus. The heart was healthy, and contained no fibrinous clots; even the *right* cavities were freer from blood coagula than usual, and presented nothing like the appearance of distension, as in ordinary cases of asphyxia.

The abdominal viscera were healthy.

There was nothing abnormal in the larynx or trachea, no œdema of the glottis, or anything interfering with the calibre of the main air-passages.

Remarks.—I think there can be no doubt that this patient died from disturbance of the brain. The phenomena presented for four hours before death, and the autopsy confirm this, but I confess I am unable to establish a clear relation between the tumour and the fatal involvement of the great nerve centres.

Three views may be taken of the case. 1st. Suffocation by the falling back of the tumour, and death by ordinary asphyxia, the brain ,becoming fatally congested in a very short time. 2d. Reflex paralysis from including a large number of the filaments of the glosso-pharyngeal nerve, the irritation being transmitted from there to the ganglionic connections of the pneumogastric and to the medulla, and thus influencing the respiratory actions, the vessels of the brain at the same time becoming abnormally distended through some peculiar influence on their walls. 3d. Coincidence.

As to suffocation. By this I mean death by the backward pressure of the tumour, or by œdema of the glottis. The last condition we know positively did not exist. If the *accident* had happened, could it have occurred without a struggle on the part of the patient? Is it possible for a person to be suddenly choked in the open air without having convulsive movements? The peculiar and violent efforts of the victims in such instances are known to all, and are particularly dwelt on by authorities. In this case there was no struggle. The evidence is positive on this. I have carefully sifted it, and find that at no time was the patient unwatched. The regular nurse saw her every few minutes, and a middle-aged and reliable woman was with her in the interim, and took great interest in her. Both of these say there was no struggle or fit, and that they did not know anything was wrong until they tried to waken her. When Dr. Andrews came, his efforts to relieve her, by drawing the tumour and tongue forward, were of no avail, and thinking the case was certainly one of suffocation, and that the cause might be lower, he performed laryngotomy without effect. There was no sudden inspiration, nor any of the phenomena of relief that ought to follow such a procedure. Lateness, I think, could not be claimed, as the patient lived three and a half hours after the laryngotomy. Then the *post-mortem* appearances. There was none of that packing, as it were, of the great veins and the right side of the heart, which peculiarly belongs to ordinary asphyxia; on the contrary, the heart was not *engorged* with blood in any of its cavities. About the time of the death of this patient, a man was waiting his discharge in the medical ward, who really *did* suffocate, and whose case affords a striking contrast to the one under consideration. He was in for syphilitic disease of the larynx. For days his breathing was of the most laboured and convulsive character. He would have violent paroxysms, would become perfectly livid, and his veins would distend almost to bursting. Then partial relief would come by relaxation, and he would struggle along, having paroxysm after paroxysm, until finally what appeared to be the last one came. He became perfectly unconscious, breathless and pulseless, and drawn up, in the sitting posture, with his knees to his chin. Dr. Wm. Pepper hastily performed tracheotomy and inserted a tube. There was no response. The man to all appearances was dead. Artificial respiration was resorted to, and after more than a minute there came a gasp, which was followed by others, and finally the man was restored, and is now about pursuing his avocation. He breathes through the tracheal tube, and enjoys tolerable health. I have merely related those points of his case bearing on the asphyxia.

I am inclined to adopt the view that this was a case of transference of irritation from the ligated tumour to the respiratory centres, and that the vessels of the brain became secondarily involved, as indicated by the "lightness in the head" and the drowsiness. The breathing phenomena already described are not unlike some of those following lesions or divisions of the pneumogastric; and although this nerve was not directly involved in the operation, its intimate connections with the glosso-pharyngeals could easily make these the transferrers of irritation to the centres which are so near each other. To be sure there was no *detectable* change in these structures or their centres, but I do not think that it can be claimed that we know all about the nervous system, and the alterations that occur in it. I am well convinced that the death was not one from mechanical obstruction to the larynx, and in this all who saw the case agree.

Coincidence is a mere suggestion, and, of course, one upon which no data, other than the mere facts of the case, can be given.

Fatal Peritonitis in Typhoid Fever, without Perforation of the Bowel. Dr. Alfred Stillé reported the following case:—

July 1, 1865, I was called, in consultation with Dr. Keichline, to see his patient, Master B., a lad of seventeen, who was convalescent from a mild attack of typhoid fever, which had begun about three weeks before. The day previous to my visit, while still in bed, and without any known imprudence in exercise or diet, he was suddenly seized with a severe pain in the right iliac region, with general coldness and collapse, from which reaction took place gradually, with fever. At my visit, twenty-four hours afterwards, the countenance was good; skin of natural temperature; pulse 116, rather feeble. Intelligence unimpaired; no vomiting, nor stool; flatus discharged with relief; abdomen moderately tense and motionless during respiration. Full inspiration occasioned pain in the right iliac region, but the whole abdomen was somewhat tender to pressure with the hand. In addition to oil of turpentine, of which six drops were taken every three hours, bran poultices to the abdomen, and beef-tea for food, one grain of opium every four hours was prescribed.

The following morning we learned that the patient had passed the night comfortably, without vomiting or stool, and with less pain. There had been some discharge of flatus from the bowels. The facies was good; the tongue moist and clean; the hands cool, but the feet warm; the legs extended; there was no spontaneous pain except on passing wind; abdomen less tender, but rather more tense.

The following day the pulse was smaller and feebler (150); respiration 24; abdomen more distended and motionless, very resonant to percussion, but not very tender; legs can be moved freely without pain; appearance of exhaustion; intelligence perfect. Large turpentine enemata were prescribed in addition to the other remedies. These symptoms continued during the day, the exhaustion becoming greater; no vomiting occurred, and but little discharge of flatus. Assafœtida was substituted for turpentine in the enemata, and produced a copious discharge of flatus with marked relief.

On the fourth day of the attack, the evidences of exhaustion were more distinct; the abdomen was rather less tense, and scarcely tender to the touch; three or four liquid stools were voided, and the urine was passed involuntarily. On the fifth day, Dr. Fricke was added to the council. Patient's debility increased, the pulse fell from 150 to 128; the skin remained warm, and the mind clear. There was still no vomiting, but several very fetid liquid stools were voided, with abundant flatus. In the evening wandering delirium commenced and jactitation; the skin became clammy and cold, and the head hot; the pulse grew more rapid and feeble, and death by exhaustion took place the next morning about seven o'clock.

On the following day I examined the body in presence of my professional associates in the case. It had been preserved in ice. The abdomen was less distended than during life; its surface was mottled with green and blue; its cavity contained about a pint of *nearly clear serum;* the upper surface of the intestines was of a dull, reddish or brownish colour, dry and sticky to the feel, and their folds were, in many places, adherent to one another by very slight and soft films of lymph. These adhesions were most distinct and firm in the right iliac region, but were easily broken up without laceration of the intestine. A very careful inspection failed to discover any opening into the bowel; but at several points there was a depression showing that there the peritoneum alone bounded the intestinal cavity. These depressions were one or two lines in diameter. The mesenteric glands were moderately enlarged, but not softened.

The glands of Peyer in the last eight or ten inches of the ileum were all enlarged and ulcerated, as well as the isolated follicles. In most of the former, the remaining gland substance had a fungous appearance, projected above the general level of the mucous membrane, and was surrounded by a hard and sharply defined edge. In some glands a portion of the follicles had been thrown off, giving to what remained a ragged, warty appearance. In several the tissues had been destroyed to various depths; and in two at least, corresponding to the external depressions before noticed, the ulcers reached quite to the peritoneal coat, but without penetrating it. There was an ulcer on the edge of the ilio-cæcal valve, about a quarter of an inch in diameter, and fungoid like the rest. Within an inch of the valve, and in the colon, were several enlarged, but not ulcerated glands.

This case has been recorded in confirmation of the proposition, already sustained by the published observations of Rayer, Jenner, Shattuck, Mayne, and others, that the occurrence of peritonitis during typhoid fever, by no means implies that perforation of the bowel has taken place. It was also singular in the absence of vomiting from among the symptoms, and in the ability of the patient to extend his limbs. Those peculiarities were so striking as at one time to inspire some suspicion that the diagnosis of peritonitis might not, after all, be correct. Under similar circumstances I should be disposed to recommend mercurial medicines in minute, as well as opium in full doses, believing that they would afford the patient one chance more for life.

REVIEWS.

ART. XV.—*Clinique Médicale de l'Hôtel-Dieu de Paris.* Par A. TROUSSEAU, Professor de Clinique Médicale de la Faculté de Médecine de Paris, Médecin de l'Hôtel-Dieu, Membre de l'Académie Impériale de Médecine, Commandeur de la Legion d'Honneur, Grand Officier de l'Ordre du Lion et du Soleil de Perse. Ex-representant du Peuple à l'Assemblée nationale, etc. etc. Deuxième édition, revué et augmentée. 3 vols. 8vo. Paris: Baillière et Fils. 1865.

Medical Clinic of the Hôtel-Dieu. By A. TROUSSEAU, Professor of Clinical Medicine, etc. etc. Second edition. Paris: 1865.

THE name of Trousseau needs no introduction to a medical public anywhere. He has been before the profession as an author for nearly, if not quite, thirty years; for that period he has been a clinical teacher in the largest hospital of a city renowned for the excellence of its medical institutions and the abundance of its opportunities of study, and to which students are attracted from every quarter of the globe. As a writer, as a lecturer, as an active worker in his profession, he has established a reputation which it is safe to say extends into every country where medicine is cultivated as a science or practised as an art. To his untiring industry, we believe, he owes this wide-spread reputation as much as to the high position he has held, or the great abundance of his natural gifts. He has exercised that quality without which there is no success, and through a long life has been a patient, earnest, devoted, even enthusiastic labourer in the field of medical science. Writing to an intimate friend upon the subject of his resignation of the chair of clinical medicine, which was tendered only last autumn, he says: "The extreme facility of addressing the pupils, and clearness of expression that have been imputed to me may be, perhaps, natural gifts, but they have also been purchased *with great labour.* Every morning I am at work by six o'clock, and half my evenings are similarly employed; for I take my clinical teaching as a serious duty, and I endeavour to keep myself up with the current of every new idea."

No work worthy of his reputation has appeared in our language,[1] the *Prescriber's Hand-Book,* bearing the name of Reveil as well as his, being elementary in character, and upon a subject affording little opportunity for display of powers. His large work on Therapeutics, written in conjunction with Pidoux, has never been translated; it is a master work upon the subject of which it treats, a treasure-house of collected wisdom and original research for all interested in the study of this particular branch of medical science. It will be noted as a singular fact, that all these works are joint productions of himself and some other writer. But on the title-page of the work before us, his name stands alone; and it is not only for this reason that it demands especial attention, but because it is the production of his mature years; it contains the experience of a life spent in learning and teaching, of one who has occupied high position, enjoyed abundant opportunities, expended great energies, been favoured with rich gifts of intellect. Such a legacy left by such a man to his professional brethren of the world, just as he is about to leave it, merits our earnest examination. In attempting to give our readers some idea of this legacy—to give them such a view of the *Clinique Médicale* as will enable them to judge of its contents and its merits—we confess to no little misgiving. Three octavo volumes of over eight hundred pages each, upon the subject of clinical medicine, are not easily examined, analyzed, and their contents fairly presented; especially is this the case when they are the production of a master like Trousseau; and anything like a thorough examination of the work and the subject would extend far beyond the limits of space in any journal. Believing, however, that our professional brethren will be pleased, as well as benefited, by an incomplete view, or one in which, perhaps, nothing like justice can be done to the merits of the author, and by such an examination as we can make of selected lectures, we address ourselves to the task.

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[1] We may except his work upon Laryngeal Phthisis, the joint production of himself and Belloc, a prize essay of the Academy of Medicine, which was translated by Dr. J. A. Warder, and published in Dunglison's American Medical Library.

Very fortunately we are aided in our undertaking by a fact at once striking and unusual; the existence of a work in our own tongue, which was not only the model for the *Clinique Médicale*, but in no small degree helped to make the man who wrote it. We allude to that most excellent work, too seldom seen in the hands of students and young practitioners of the present day, *Graves' Clinical Lectures on the Practice of Medicine.* Trousseau has been a devoted student and an ardent admirer of Graves; he has modelled his work after his—has modified his therapeutics from his experience—has even named a disease after him! for bronchocele associated with exophthalmus, he called *Graves' Disease!* These statements are not implied or a matter of judgment, but are made directly by the author himself. Only three or four years since, a French translation of Graves' work was published, to which he furnished an introduction. In this introduction he entreats those of his pupils who understand English, "to consider it as their breviary," and says, "of all the practical works published in our time, I am acquainted with none more useful, more intellectual." Farther:—

> "I have incessantly read and re-read the work of Graves; I have become inspired with it in my teaching; I have endeavoured to imitate it in the book I have myself published on the Clinique of the Hôtel-Dieu; and even now, although I know almost by heart all that the Dublin professor has written, I cannot refrain from re-perusing a book which never leaves my study."

Generous testimony, and heart refreshing, in a world which has never abounded with instances similar to it; and what reward to the lamented Graves, could he have seen such fruit harvested from seed he had sown, and such evidence of the value of his talents and his labours!

After stating that the work is modelled after that of Graves, we do not know that more is necessary as to its aim and scope. Faithful to its character of "clinical," it passes from subject to subject as the physician passes from bedside to bedside, finding a different disease in each. The only appearance of method is the grouping of the exanthemata with which the first volume opens; yet without the order and arrangement of a regular treatise on practice, the work is so extensive as to range over the whole domain of medicine, and few if any of the important diseases are omitted, while in regard to some of them, he is, in fact, copious of detail.

The form of lectures affords to the author more freedom of illustration than would become a formal treatise, more familiarity of address, and more impressiveness of manner. It is a form to which his style is peculiarly adapted; easy and flowing, yet dignified and often eloquent, it resembles that of our Watson, and the perusal of this work, like that of the *Lectures on the Principles and Practice of Physic*, is often more a pleasure than a task.

The present is the second edition of the work; the first was in two volumes, and was not long before the public until it was exhausted; in preparing a new one, the author has enlarged it, by the addition of new subjects, rather than by the modification of doctrines which, he intimates, he is not likely to change at his time of life. The principal subjects considered in this edition and not in the first, are: neuralgia, glosso-laryngeal paralysis, hydrophobia, chlorosis, purulent infections, uterine phlebitis, phlegmasia dolens, retro-uterine hæmatocele, cerebral rheumatism. Some of these, it will be seen, are generally found only in works on diseases of females; but besides these, in the work there are lectures on amenorrhœa, menorrhagia, and puerperal convulsions.

As the first three chapters of the work of Graves are devoted to subjects introductory and accessory to the study of clinical medicine, so Trousseau opens with an "introduction" where, within the compass of about fifty pages, are to be found his views upon many subjects of the greatest importance and the deepest interest both to students and to practitioners. The aim, importance, and best method of studying clinical medicine, the relative duties of the clinical teacher and of those who follow him, are touched upon, and then he branches out into brief disquisitions upon the science and the art of medicine, the nature of disease, the power of remedies, empiricism, and rational therapeutics, with other kindred subjects. No one, certainly, is better entitled to speak as a master or be received as authority, and we shall therefore pay particular attention to this part of the work, and quote from it liberally, not only because of its inherent interest, but, the author being here free from detail of symptoms or statement of treatment, it affords, perhaps, the best specimen of his style.

First of all, he is in favour of an early attendance upon clinical instruction, believing that the information gained, although at first confusing and fruitless, will nevertheless be soon valuable. Differing from what we believe to be the generally received doctrine, he prefers that the medical should precede the surgical clinic. Perhaps the love he bears for his department of the profession has warped his judgment in this particular, for it certainly seems reasonable that things to be seen, felt, and handled are better subjects for "first lines" than those which are hidden from direct observation; that it is easier for a beginner to understand the deformities of a broken or dislocated limb, and the *rationale* of its treatment, than to trace a cough to its pathological origin, and comprehend the therapeutical influence of the remedies prescribed.

But we will let him speak for himself:—

> "The young man is attracted by the spectacle of surgical operations; the solemnity of the preparations, the address of the surgeon, the direct results obtained by the operator, strike and seduce his youthful imagination; but he is only assisting at a barren spectacle for him. Even to understand the mechanism of the reduction of a fracture or a luxation requires a considerable acquaintance with anatomy and physiology; and the student who witnesses those delicate operations in which the surgeon does not make a stroke of the bistoury without recollecting the most minute anatomical details, cannot comprehend how much skill, and coolness, and intelligence are necessary to effect results immense for the operator, but inappreciable by him who as yet knows nothing. I have always observed that young gentlemen are more attracted by those operations

> which demand scarcely more intelligence than is necessary to a butcher for the slaughter of an ox, than by those marvellous procedures, those delicate and intelligent manœuvres, which are the work of the true surgeon, and which fill with admiration those who, being already profoundly instructed, can comprehend and appreciate them. You will not, therefore, derive much profit from attending the surgical wards until you are well grounded in anatomy, while for the first steps in medicine some superficial notions of physiology will suffice. You will habituate yourselves to see patients, to read upon their countenances the gravity of the disease; you will learn to feel the pulse, and to appreciate its qualities; you will take your first lessons in auscultation and percussion; you will learn early to recognize the great functional disorders of the various systems of the economy, the modifications of the secretions and excretions; you will see in the autopsy-room some of the relations which exist between the cadaveric lesions and the symptoms or signs observed during life; and already in a few months you will have learned many things of great value. It is very true, there will be a great many undigested notions; but, step by step, the teachings, and, above all, the familiar conversations of your preceptors and of your fellow-students, will aid you in arranging and mastering these materials, and you will soon have acquired knowledge enough to make your future studies attractive."

Then follows a paragraph which betrays the true lover of his profession:—

> "It seems strange to the world to hear physicians talk of the charms which attend the study of our art. Yet the study of letters, of painting, or of music gives no more lively pleasure than the study of medicine, and he should renounce our profession who does not find in it, from the beginning of his career, an attraction almost irresistible."

Our author, like his prototype, Graves, is not in favour of students devoting much time to the accessory sciences, and both select chemistry, as being peculiarly the "handmaid of medicine," for the subject of especial remark. As the latter tells his readers that it is not necessary to "dive into all the arcana of the science," and load their memories with "atomic numbers, symbols, and equivalents," because their time is limited, and because "few and scanty, indeed, are the rays of light which chemistry has flung on the vital mysteries," so Trousseau takes the same ground, and for the same reasons. They are not alone, however, in this; we believe it is a common doctrine with teachers of clinical medicine. We can call to mind several who also teach it, among them one of the best writers upon clinical medicine in our language, Dr. Latham, the author of *Diseases of the Heart.* He, too, when reminding the student of the many subjects claiming his attention, the professor of each too apt to urge his own as indispensable, forcibly impresses upon him the fact that the "*life of man is but three-score years and ten,*" as one imperative in its claims to attention, and despotic in its commands to sacrifice the desirable and ornamental to the practical and indispensable.

> "The little time you have to devote to medicine renders the study of the accessory sciences extremely difficult for you. It is important that, before entering upon your medical studies, you should have obtained sufficient knowledge of chemistry and of physics to understand the application of these sciences to medicine; but I should profoundly deplore the time you would lose in attempting to acquire a too extensive knowledge of chemistry. Although chemistry renders to medicine, properly speaking, but very limited services; although, in general, men the most eminent in chemical science have been but poor physicians, and, at the same time, the true practitioners have always been but sad chemists, I would nevertheless admit that it would be desirable for the physician to have the most extensive knowledge possible of chemistry, if only to convince him of the vain pretensions of this science, which claims to understand and explain the

laws of life and of therapeutics because it understands and explains some of the reactions which take place in the economy. The life of man is scarcely sufficient for the study of physiology, medico-chirurgical pathology, and therapeutics; why, then, demand the student to dissipate his attention in the pursuit of accessory studies, which, if not completely useless, are nevertheless of too little importance to sacrifice for them physiology, clinical medicine, and therapeutics, without a knowledge of which there can be no such thing as a physician."

He then propounds for the chemists the problem of the egg fecundated and non-fecundated, and challenges them to show, by the most minute chemical analyses, the difference between the two; and concludes that if "the retort has its mysteries," as the chemists claim, the impregnated egg has them also, and of even a stranger character! But, evidently fearful of being misunderstood upon this point, he says:—

"But it is far from my intention, gentlemen, to arraign and condemn the accessory sciences of medicine, and chemistry particularly; I only condemn an exaggerated estimate of the value of these sciences, and their pretensions, and their maladroit and impertinent interference with our art. No one maintains, so far as I know, that all the compositions and decompositions, all the molecular movements, all the manifestations of the forces belonging to the vegetative life, may not be physico-chemical acts; but if there be some among these manifestations governed by the same laws that rule over dead matter, there are also others, and they are the most numerous, the most important, the most essential to the living matter, which obey laws essentially different; laws which chemistry may perhaps discover some day, but which for the present remain autonomic, special, unexplained, inexplicable, and before which chemists and physicians stand alike vanquished. Let them maintain, if they will, that in a future more or less distant they will subordinate the laws of life to those of the retort; I consent; but, until the new order of affairs is established, I desire them to be modest, and not to thrust upon us their hopes for acquired truths. I willingly confess my ignorance as a chemist, but upon condition that they confess theirs as physiologists and physicians."

The nature of disease is the next subject in regard to which our author attempts to inculcate correct ideas. Probably there is no other point than this upon which physicians and the laity are so wide apart, and the first thing for the student of medicine to do is to dispossess himself of all the current popular notions in regard to the material nature of disease, and to learn, once for all, that it is a changed mode of being, and not an entity. To the inculcation and illustration of the similarity between physiological and pathological processes the author devotes several pages. Starting with nutrition, the derangements of which play so prominent a part in disease, he makes the striking comparison of each ultimate organic molecule to an animal "with a mouth represented by an artery, an anus represented by a vein," and the mass of granules and nucleoli making up the cellule for a body; the compositions and decompositions proceed harmoniously until the artery supplies food too profusely, producing a temporary embarrassment, from which the cell soon recovers by its own inherent powers; the next step is to consider the little animal supplied with unhealthy food—a vitiated blood comes to supply its wants, producing a more profound derangement of its internal changes, from which, however, recovery without aid is by no means improbable. Passing now to the general system, he finds a starting-point in the slight febrile condition which follows a hearty meal—the fever of digestion—the simplest form of disease, which speedily terminates in health, and thence to wider and more complex departures from health. All this is very fine; excellent for the student in every respect. It is intended, of course, merely for a sketch of the subject, and by no means aims at its exhaustion; its lesson is the power of nature to restore the disordered economy to a state of health, and that there are times when the physician "cannot be more useful than by limiting his efforts to the observation and direction of the vital forces." Upon this topic we will quote from him directly:—

> "We believe too much in ourselves, and we have too little faith in what we metaphorically call *nature*. We do not bear sufficiently in mind that the morbid impulse having been given, matters will return again to their normal condition, and that nothing should be so much respected by the physician as this return to activity of the natural functions, which will henceforth do more for the cure than all the agents of the materia medica.
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> "When, under the influence of that particular modification of the economy which, for want of a better name, we call *inflammation*, an effusion of serum and of plastic lymph has taken place in the pleura, we essay to interfere, and, let us say, in a great number of cases we interfere beneficially, but the limit of that interference is what most physicians understand the least. To see the obstinacy of our medication, the incessant and tumultuous activity of our therapeutics, it seems as if we distrusted nature and jealously wished to do everything ourselves, and without her aid. Now, when once the inflammatory state is dissipated, something yet remains, and this something, so clearly appreciable by auscultation and percussion—I speak of the exudation—engages our attention, and demands our consideration more than the local lesion which produced it. We refuse to believe that the inflammatory orgasm having been dissipated, that immense organic cellule, which we call the pleura, can return to its normal functions and do what the ultimate organic utricles do without cessation in the act of nutrition. The pleura will go on and absorb and scatter the morbid products it contains, and ordinarily it will suffice for this task, which, however, it generally accomplishes but slowly. I accept, without difficulty, the fact that paracentesis will spare it much labour, even as a thorough emetic is the best and most salutary of remedies for an overloaded stomach; however, when the effusion is most excessive, when there are irrevocable tubercles in the lung or on the surface of the serous membrane, the natural functions and innate powers of the pleura suffice for the resorption of the effused liquid, and the production of a definite cure."
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> "Once more, gentlemen, do not forget that in acute diseases the time for beneficial action passes rapidly, and the time for expectation speedily arrives; and while freely admitting that in chronic diseases the active, patient, and renewed intervention of the physician may long be useful, nevertheless, even in this class of cases, we must sometimes close firmly our hands, which are full of medicines, and wait yet a few days; very often we shall then see the normal functions, which were overcome, oppressed, or exhausted, reawaken, and we can assist, with pleasure, the powerful efforts of that force, which has been named, without being too well understood, the *vis medicatrix naturæ*."

It must not be inferred from these extracts, of which we admit the language to be strong, that Trousseau's treatment of disease is mere expectation. All through the work we find active and energetic medicines prescribed, and, indeed, in this respect his therapeutics approaches more nearly to that of British practice generally than any of his countrymen with whose writings we are familiar. This is but another example of the influence of Graves, an acknowledged example, too, for in the "introduction," already alluded to, he says that from him he learned the use of "mercurials, essence of turpentine, spirituous liquors, nitrate of silver," and some other remedies used by the Irish practitioner so differently from the French. It is the unnecessary use of active remedies against which our author would guard, because if unnecessary almost certain to be injurious. Thus, further on in the work, in the lecture on erysipelas of the face, he says that, unless under special conditions, it is a disease almost certain to end in recovery without aid; that of fifty-seven cases carefully observed in hospital practice, and untreated, but one died, and of all he ever saw, hospital and private practice together, not more than three have died. With so slight a mortality, why resort to active medication, he asks, especially as he has reason to believe that one of the deaths which did occur could be more fairly attributed to the treatment received than to the disease. Speaking of pneumonia, on the other hand, he says that he has long been tempted to leave acute pneumonia to nature, being inclined to doubt the powers of medicine over it, yet he could never feel justified, or as if he had fulfilled his duty, did he fail to make use of antimonials, emetics, and digitalis, convinced, as he is, of their utility.

He is not, then, a discarder of medicine, but a firm believer in the necessity and the practical utility of a knowledge of the course of diseases when uninfluenced by remedies. "*To know the natural course of diseases is more than half of medicine.*" "By the aid of this compass the physician can surely direct his course in the difficult study of therapeutics; it is by this he will be enabled to appreciate systems as they succeed one another, each speedily dying overwhelmed by the advancing waves of its successor."

But how to learn this natural history of disease? It is not an easy task. Our author admits that it is not, and confesses that if difficult and embarrassing to those of age and experience, who have passed a lifetime in hospitals, it must be infinitely more so to the beginner. But he advises him to begin early to make and record observations, to "follow the practice of several physicians, depend not too much upon the word of the teacher, do not remain servile scholars, follow, observe, compare." He alludes to the inference which cannot be escaped when a certain disease is seen generally to end in recovery under modes of treatment directly opposite; he advises particular attention to cases brought into the hospital having passed many days without any treatment, and advises an entire abstinence from remedies, in some cases, where life is not at stake. The manner of conducting, and the extent to which experimentation in the treatment should be pursued, is then the subject of some excellent remarks, guarded by the statement that there could not be a physician in the world who could experiment merely for the sake of the experiment, but always guided by some facts and observations previously acquired, and influenced by the hope of rendering further service to suffering humanity; that experiments made only for curiosity would be culpable; and then follows a passage alike honourable to his head and his heart:—

> "But how much more culpable still would be the physician who experimented in the hospital; there, where that responsibility is absent which, in private practice, often makes him tremble; there, where he is not to answer for the interests of his position which might be compromised; there, where the patients are under his authority and cannot resist, except at the risk of being ejected from the hospital and left without asylum and without succor. Strive, gentlemen, if you have ever seen such conduct, so rare, thank God, strive not to imitate it. You will prepare for yourselves remorse which will follow you throughout your career."

The subjects of empiricism and rationalism are but briefly, yet most ably, touched upon; their intimate connection, and the impossibility of sundering them is most clearly shown and strongly impressed. "If the primordial fact be purely empirical," he says, "its consequences and its relations belong to the intelligence of the physician who knows how to discover them." He most happily illustrates this by the example of Peruvian bark, the use of which was at first purely empirical, but by the labours of Torti and Sydenham has been extended, and its powers, as it were, multiplied, until its application forms almost a system of medicine, while of its mode of action we remain as ignorant as those who first used it. All this is so well presented as to deserve reproduction here.

> * * * "Thus, then, even when a remedy is adapted to but one disease, when nothing, no induction, directs us to a trial of it; when, consequently, it seems to belong exclusively to the domain of empiricism, the physician can still step in with his intelligence and institute a system of medication with but a single medicine.
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> "He does not systematize; he does not theorize, but he appreciates the opportunity for the use of the remedy, its influence in the special case and the duration of that influence. He regulates the doses and the repetition of these doses. He seeks means of rendering the medicine more inoffensive. He examines if there does not exist, in the accessory conditions of the disease, other indications which experience has already taught him to appreciate and to meet. He sees that the anæmia which accompanies malarial poisoning yields with readiness to the same remedy which succeeds so well in the chlorotic cachexia, and iron becomes, in the hands of the physician, a useful adjuvant unknown to the empiric. The empiric can cure a paroxysm of the fever; it belongs to the physician to cure the fever itself. The physician is able to make a diagnosis impossible to the empiric. To know that a patient has, every day, a febrile paroxysm, commencing with a chill which is followed by fever and sweating, this is a matter of the most common observation; it is not a diagnosis: but to know that the paroxysm is not connected with a hidden phlegmasia, a deep-seated suppuration, a special disposition of the nervous system, so common in certain females—to know that it is really the expression of the influence of the malarial poison—this is an exceedingly complex notion which can only belong to the domain of the physician. To appreciate now the gravity of this poisoning, the influence which it has exercised, and which it will yet exercise upon the individual affected, and to proportion consequently the duration and the energy of the medication to the gravity of the disease; this again is what does not come within the powers of the empiric.
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> "Again, when it becomes necessary, in cases of masked fevers, simple or pernicious, to find the clue which leads to a notion of the cause and of the intimate nature of the disease; when in case of a man who has a cough, orthopnœa, bloody expectoration, a stitch in the side, it becomes necessary to lift the deceitful mask and discover the intermittent fever which demands imperiously the immediate employment of quinia in large doses; when it becomes necessary to seek and discover the same indication in the midst of the most violent disorders of an accession which is prolonged and affects the forms of a continued fever; in such cases the physician alone can interfere beneficially, and the rude empiric, who, by chance, has cured a paroxysm of intermittent fever, is unable to manage the resources of therapeutics even in the most simple cases of the disease, and knows not even what article to make use of in its complex forms."

We must pass over now much that would be interesting to our readers, well worthy of reproduction. The variety of nosologies and nosologists is strikingly pictured; the most perfect independence of judgment is inculcated, and the great importance of personal observation is impressed, and these subjects occupy several of the following pages. He then enters into a consideration of the methods of study, and an inquiry as to which is the best. All of them are founded upon the observation of facts, and observation implies comparison; to see, observe, and compare, are the elementary proceedings; upon this all are agreed; but, when it comes to the interpretation of the facts observed, there is a diversity of method pursued; there are two principal methods, "one called the modern, the *numerical method*, the other the ancient, or the *method of induction*." There are several paragraphs of comparison and comment upon these methods, so admirable that we cannot omit them, and only regret that we cannot give the subject entire.

> "The numerical method has taken for its device the celebrated phrase of ROUSSEAU: 'I know that truth is in things, and not in my mind which judges them; and that the less of myself I put into the judgments I make of them, the more sure I am of approaching the truth.' The second is that which has thus far been followed by all the great practitioners, whatever may have been their doctrines in other respects; it has been maintained by the majority of the professors of our faculty. * * * * * *
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> "The numerical method recognizes the sovereign power of figures. The physician must restrain the bursts of his imagination; he analyzes, counts, and sternly registers the results; nothing more, nothing less. It is the inflexibility of the upright magistrate who administers the law without listening to his passions or his inclinations; it is the rigor of the statistician, who, making up a table of mortality, takes no account of the causes of death, but limits himself to a calculation of the expectation of life of the mass of the population. The numerical method, finally, applies to medicine the calculation of probabilities in all its severity.
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> "The method of induction proceeds entirely otherwise; it collects, analyzes facts; but it also compares, and not alone counts them. Instead of the *necessary* result of the statistics, it seeks something else, the systematic connection of the facts, their union; it interrogates them, comments on them, separates them, groups them, examines them in all their aspects, in order to draw from them some new application. In a word, reversing the numerical method, '*it puts the greatest amount possible of self in the judgments which it renders upon things, being very sure of thus approaching more nearly the truth.*'
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> "I do not reproach the numerical method with counting, because we cannot systematize without counting; but I reproach it for only counting; in a word, for adhering to the exact result like the mathematician. I reproach it for counting too much, for counting too long, for counting always, and for not being willing to put mind into facts.
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> "This method is the scourge of intellect; it makes of the physician an accountant, a passive servant of the figures he has added up; and the greatest reproach I have against it is of stifling medical intellect."

After showing somewhat more at length the difference between the two methods, and that the counting of the numerical method is no more exact than the results of the other method, he continues :—

> "And do not imagine, gentlemen, that this mathematical exactitude really exists; it is only relative, for it changes under the observation of the same person, according to the year, according to the season, according to the medical constitution. So that the same fact which was observed one time in five last year, this year occurs but once in ten; next year, perhaps, it will happen but once in twenty; so that your law, your *real truth*, is not absolute, and cannot be; and if the pathologist seeks to formulize the facts which twenty partisans of the numerical method have given, each as the expression of extreme exactitude, he is still obliged either to take an average, which to-morrow will be no longer correct, or to recur to those axioms and detestable expressions, which it is attempted to banish from medical language: *sometimes, often, very often, generally.* * * * * * * * *
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> "'But,' you may say, 'the numerical method enables us to verify the assertions of a physician.' Do you then think, gentlemen, that if a person will lie he cannot do it as well with figures as with general statements? Do you think that unreliable and false physicians, if such exist, will not make up a numerical statement as well as any other? Such an one will only take the trouble of lying more precisely than another; he will be untruthful in the history of which he

has fabricated the details, and give an exact result; the other, with less labour and hypocrisy, will only deceive in the conclusion."

Continuing his remarks upon the collection of facts and the necessity of weighing, rather than numbering them, he continues:—

> "'It is better,' says Gaubius, 'to stand still than to advance in darkness.' But how has the human mind advanced from the commencement of time? I ask you, was it not to verify an hypothesis that the adventurous mariner turned his prow towards the west and confided to unknown seas, his genius, his glory, and the life of his adventurous companions? What ideas were germinating in the brain of Galileo before he discovered the pendulum; and do you believe that he needed to see a thousand candelabras oscillate under the dome of Pisa to create that admirable hypothesis which soon entered into the domain of science? Toricelli formed an hypothesis, he put mercury and water in tubes, and discovered a law. Lavoisier weighed the peroxide of mercury, and modern chemistry was discovered. All the science was revealed to him by a single fact. How many millions of persons had seen the steam raise the lid of a tea-kettle? Watt saw it once, the fact was fecund, and the man of genius invented the steam engine, and at once rendered himself and his country illustrious.
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> "I say then, 'better walk in darkness than to stand still,' if you understand by darkness the primary facts and the intellectual processes which bring forward the secondary ones. Why has God given us a mind which tends incessantly towards progress and devours the future? why has he given us an ever active intelligence restless to compare, to abstract, to induct, to systematize, if not that the faculties of the understanding may work without ceasing upon those primal things which we call facts? And what are the products of this work if not the ideas, the inductions, the hypotheses, the systems, which it is attempted to verify by the numerical method and by statistics?

All this, he says, concerns the science of medicine, not the art; for art and method are terms which mutually exclude each other. *Is medicine a science or an art?* This question leads to a definition of the terms and to the statement that, however desirable it might be to be able to think otherwise, he is compelled to decide that it is, as yet, an art rather than a science. But every science touches upon art at some points, and every art has its scientific aspect; it is so with medicine. For the science learning is necessary, but the artist, in the highest sense of the word, is born, not made. These are his doctrines, and he follows them with a strong admonition to students not to believe themselves physicians because they have some scientific acquirements, which are but instruments for the use of art, as the telescope and the lens are to the astronomer and the naturalist; the learned man and the practical man being very different things.

> "Almost all of you, gentlemen, know more of chemistry than Paracelsus, many among you more than Scheele and than Priestley, some even more than our Lavoisier; you know chemistry, but you are not chemists; and, among those who listen to me do you believe there are many whom posterity will judge worthy of a place by the side of these men whose glorious names I have just cited to you? There is, gentlemen, a vast difference between the *savant* who collects and the *artiste* who produces."

The following upon the deleterious influence of an overburdened course of study, and the tendency of multiplied instruments and means of observation to cripple mental development and exercise should be received and remembered as coming from one well qualified by position and experience to speak with authority.

> "And, gentlemen, it cannot be denied that the numerous means of investigation which we now possess, by multiplying our primary notions, or at least by

rendering them more exact, do not put the mind in such conditions that its artistic manifestations are more numerous, more practical, or more certain. How is it that the intellect becomes more indolent in proportion as scientific notions increase in number, content to receive and to enjoy, careless to elaborate and to produce? The formulæ of the science aid the art less than one would believe. Chemistry has taught you to make colours; it tells you when and why they do not harmonize; it has taught you to fix them upon canvas more permanently and better prepared; an illustrious man has made known to you the modifications which they exercise one upon the other; in a word, there is a science of the harmony of colours. And yet the blood circulates from the pallet of Rubens, fabrics glitter on the canvas of Vandyck, and the madonnas of Raphael still show all that beauty has of the pleasing and the divine. Why then, with so many means of study, with so many precise scientific notions, do our painters remain so far behind the less-wise masters who are the glory of the art? Why do not we, so rich in preparatory knowledge, so fertile in means of diagnosis, why do not we produce such men as Baillie, Sydenham, Torti, or Stoll? It certainly is not because Nature has been more niggardly in her gifts; every generation brings forth like intellects, and periods of barbarism the most abject have probably had men as vigorously organized as those of Pericles, of Augustus, of Leo X., and of Louis XIV. How many times, in our intercourse with the young men who crowd upon our benches, have we not recognized those choice spirits to whom nothing was lacking to produce fruit, but an opportunity of usefulness and a favourable direction But those who distinguished themselves by an exceptional aptitude when they had acquired, by a labour, which is perhaps long but by no means difficult, that knowledge which constitutes the preparatory sciences, and to which is unfortunately accorded so large a place; when they had, after some months, equalled or surpassed their masters in the facile art of applying their senses and the various instruments to aid them to local diagnosis, proud of a conquest which had cost them so little trouble, encouraged in this good opinion of themselves by those to whom all medicine consists of these things, they habituate themselves to intellectual idleness and fall into a sort of mental inertia; while our predecessors, less rich than we are in that knowledge which we should so much utilize, laboured without cessation in the work of production; poor, they put under contribution the slenderest acquirements which chance or experience gave them; they exercised incessantly the powers of their mind, as the athletes exercised their muscles, and there resulted a power which sometimes betrayed itself by singular errors but often also by views full of grandeur and fecundity. Efforts were multiplied by reason of poverty of means, and the results were immense; and you, around whom means are so abundant as to embarrass and enervate, satiated with what is so abundantly offered, you only receive and swallow, and your clogged intellect is smothered by obesity and dies unproductive.

"Pray, gentlemen, a little less of science, a little more of art."

It is time to turn to the body of the work and examine some points of theory and of practice. The field of clinical medicine is so extensive, and presents so many subjects of equal interest, that a choice is embarrassing, when but a point or so can be touched upon; we find it particularly so, when almost every lecture seems, perhaps to our too partial judgment, full of valuable matter, presented in a manner making its perusal a pleasure. But we pass over that well-marked class of diseases, the exanthemata, the examination of which occupies some hundred and fifty pages, and the lectures upon erysipelas and herpes zona, together with enteric or typhoid fever, here *dothiénentérite*, and arrive at the anginose affections. We select these for our consideration, on account of the interest which attaches to them, especially of late years, since diphtheria has raged as an epidemic in many parts of our country, and because the experience of our author has been very great with this class of diseases, surpassing even that of any other physician of the French capital. This he attributes to two causes:

first, his long term of service, eighteen years, at the head of the children's department of the hospital; and, second, to his introduction of tracheotomy for laryngeal diphtheria, which has been the occasion of a frequent demand for his services in consultation. Two other facts, which we gather from the work, would also seem to fit him peculiarly for treating of these affections: his frequent visits to districts where diphtheria was prevailing with unusual severity, and his pupilage under Bretonneau, the father of the modern literature of this disease.

The subject of gangrenous angina occupies one lecture. The gangrene may be the result merely of excess of inflammation, when the disease is termed *simple*, a form exceedingly rare, but of which cases are detailed. Far more frequently it is a *complication* of other grave, general, or distant diseases, as dysentery or typhoid fever, or of other throat affections, as scarlet fever and diphtheria. The fact that gangrene is however very rare in the latter disease, is dwelt upon and repeated, because of the deceitful similarity of appearance being likely to mislead the inexperienced.

Following this, comes a lecture upon phlegmonous angina, acute tonsillitis, more commonly known as quinsy, a disease far too low in the scale of importance to merit any attention here, were it not that we find some new views expressed, as well as an admirable illustration of the author's candor, and an application of his views of the importance of an acquaintance with the natural course of disease. "There are diseases," we are told, "which are the glory or the despair of therapeutics; they are those which get well spontaneously, and those which no medication can check;" acute tonsillitis is one of them.

> "I repeat, gentlemen, phlegmonous angina is one of those diseases which are the glory and the despair of all medication: their despair, because medicine cannot prevail against them; we are powerless to check their progress, to abridge their duration; their glory, because they cure themselves, whatever we may do, and the temptation is to ascribe to the medication the honour of the cure."

He then sketches the rise and progress of the disease, gives a case in illustration, and passes in detail over the remedies which have been and are prescribed for it; locally, incision, scarification, laceration with toothed forceps; generally, the antiphlogistic treatment, bleeding from the arm, the foot, the ranine vein, cups between the shoulders; leeches around the neck, to the anus, the vulva, and even by Broussais, to the pharynx! He looks with some favour upon evacuants, especially ipecacuanha, where there are indications of derangement of the *primæ viæ;* but, in spite of all, the disease continues its progress; in four or five days, perhaps nine or ten, an abscess forms and bursts, and the patient is well. All the remedies have been useless, the more violent ones injurious.

> "As soon as the accidents produced by the angina have disappeared, the return to health is immediate, and nothing more is necessary but to take precautions against a relapse. But the patient has been bled from the arm; at least leeches have been applied in greater or less number; these losses of blood, especially in case of an infant or delicate person, have occasioned an exhaustion, for recovery from which some time will be necessary. This consecutive anemia will be worse than the disease which you have so vainly sought to conquer; it entails debility, loss of appetite, slowness of digestion, palpitation of the heart, and other nervous troubles which may continue to manifest themselves for a month or more."

He does not attempt to conceal the great sufferings sometimes experienced by the patient in this disease when unable to swallow, and apparently near suffocation, or the fact that he will make urgent appeals to the physician for relief. Nevertheless, in his long and extensive experience, he has never seen a fatal case; he does not deny that it may cause death by extension of the inflammation to the upper part of the larynx, and be productive there of œdematous infiltration, but does not mention death from hemorrhage consequent upon the opening of an arterial branch, when the abscess bursts, several cases of which are reported in Watson, and one case of which occurred under our own observation. He quotes from Louis the report of 23 cases, 13 of which were bled and energetically treated, and 10 were not; the mean duration of the disease was, in the former, nine days, in the latter, ten and a quarter, a result highly favourable to the milder measures.

> "Expectation is, consequently, the best treatment you can follow in the disease which now occupies our attention; but this treatment, I admit, is most difficult to make acceptable in practice, especially when you are beginning your career and have not yet inspired that confidence which you will do later. In order to respond to the just demands of your patients, prescribe remedies for them of no great power. If you cannot really cure them, at least leave some illusion to those who suffer, and do not make them despair by avowing your impotence. Order acidulated and demulcent gargles and emollient fumigations, knowing perfectly well that they will effect nothing towards the cure of a disease, which in a short time will come to a termination."

He further fortifies his doctrines by the experience of two of his colleagues, who suffer from repeated attacks of the disease, and have arrived at the same result as to remedies. One of them says:—

> "I have become very skilful in the treatment of this disease; I give my patients the ptisan of barley-water when they can drink; I prescribe foot-baths for them, and that is all my therapeutics For myself, I do better still, if possible, I keep my room and my bed, I wait patiently, and my sore throat gets well as soon as formerly."

The author has yet to dispose of those gentlemen who claim, with caustics, antiphlogistics, and revulsives, to cut short the disease during the first or second day. He does it by asking—

> "Where, gentlemen, is the physician skilful enough to decide that a sore-throat, which has only begun, will necessarily be a phlegmonous angina? For my part, I plainly declare my incompetence upon this point, and I doubt if others are any more able than myself."

A second answer he has for them in the existence of an angina of rheumatic origin, which he proceeds to describe as painful in character, but ephemeral in duration, and which has given rise to many errors of diagnosis, and much erroneous judgment upon the effect of remedies.

Membranous angina forms the subject of one lecture, and will serve as an introduction to diphtheria. The principal interest attaches to it from its great similarity to this disease, and demands notice because of the eminent authority which here testifies to the existence of a disease impossible to distinguish from diphtheria, except by its course; and which lays down the doctrine, that the presence of a membrane in the throat is not alone sufficient to form a diagnosis. In this, we believe, he differs from writers in our language generally.

Under the name of membranous angina [*angines couenneuses*], a name which he deems "excessively vague," may be comprehended a considerable number of affections, having a membrane as a common element, arising from the great proneness of mucous membrane to cover itself with fibrinous exudation when inflamed, excoriated, or cauterized with solid nitrate of silver and the stronger acids. Cantharides is particularly mentioned as a remedy, which, when applied to the mucous surfaces, produces an exudation identical in appearance with that of diphtheria, and distinguishable only by the fact that the one remains circumscribed and soon disappears, while the other persists and spreads. He mentions also a scarlatinal membranous angina, and a mercurial, "too often confounded with syphilitic." But the disease in question is none of these, which are complications of other diseases, or the effect of direct applications, but is distinguished as simple, or "common" membranous angina. The anatomical element is, originally, *herpes of the pharynx*, the herpetic eruption, only discernible when the case is seen early and under very favourable circumstances.

The treatment of the disease is of the simplest character, and merits no attention; the whole interest of the subject hinges, as before said, upon the question, whether there is really a *membranous* disease of the throat, independent of complication, which is *not* diphtheria. Carefully reading his description of the disease, weighing his points of diagnosis, and duly considering his admissions, we cannot think the author has made out his case; not, at least, clearly enough for a practical consideration at the bedside. Were it not that in his description of diphtheria, he plainly makes two classes, the mild or benignant, and the malignant, and for his views as to the different origin of the two diseases, we should call this form of disease, as we certainly should such cases in practice, examples of the mild form of the more severe malady.[1]

The more distinctly marked character of the febrile symptoms and of pain in the throat, etc., which ushers in the milder disease—the simple membranous angina—are much relied upon as distinguishing it from diphtheria. Yet this latter disease, we are very certain, varies much as to the intensity of its initial symptoms, and it is only "sometimes" that it presents that insidious character, in which the patient is near death before professional advice has been called for.

Engorgement of the submaxillary glands is given as a point of differential diagnosis; "the submaxillary glands are swollen, but only moderately so, and far from what we see in diphtheria, where, in certain circumstances, the engorgement is very considerable. In common angina palpation alone enables us to discover it." But upon this point an eminent English writer differs with our author, and distinctly states the difference of opinion, even when the existence of the two diseases is not under consideration, but merely in describing to students the frequency and extent of ganglionary implication.[2]

The duration of the general symptoms for a few days before the appearance of the eruption is another point, and again he is at direct issue with the author just quoted, who says, "You may often suspect that the disease is diphtheria before the exudation occurs; and sometimes may be almost certain that it is so; just as in measles or scarlet fever you may venture on a diagnosis before the anatomical character of those diseases, *i. e.*, the eruption, has appeared."[1]

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[1] "Cases characterized, it is true, by more or less diphtheritic exudation in the fauces, but unattended by any urgent symptoms, form a large proportion of every epidemic. Sometimes it even happens that almost all the cases in particular epidemics are of the mild kind. Such cases usually recover under any rational mode of treatment, and it is the consequent great apparent success in treating them which has, sometimes, led even honest and worthy practitioners to promulgate as a specific for diphtheria some medicine with which they have treated large numbers of cases; the truth being that by far the greater proportion of these cases required only common care, and would probably have recovered without any medical treatment at all.—*Clinical Lecture on Diphtheria.* By ED. HEADLAM GREENHOW.

[2] Diphtheria: its Symptoms and Treatment. By WM. JENNER, M. D., Prof. of Clinical Medicine, University College; Physician to Hospital for sick Children, etc. London, 1861.

When the case is seen early the herpetic eruption can be seen, or when it is present at the same time on external parts of the body, the diagnosis is easy, but generally, under the circumstances of daily practice, it is difficult, if not impossible, and the disease is very frequently confounded with diphtheria, the evil results of the error being a loss of time in attacking the graver malady, and an overweening confidence in remedies engendered in the mind of the physician who has met with only the simpler malady, a confidence which produces disastrous results when he comes in contact with diphtheria itself.

He admits that this common membranous angina prevails epidemically, but with far less mortality than diphtheria; that it occurs, interspersed with diphtheria, when this is raging; that it becomes frequently the "point of departure," or, in other words, degenerates into diphtheria, and quotes illustrations and examples from his own reports made to the Imperial Academy of Medicine in 1859.

In what, then, does he find the necessity for making two diseases of groups of symptoms so similar? In their intimate nature, or, rather, in the nature of the *cause* which produces them. One is a simple and local disease, although sometimes epidemic, more generally sporadic, the membrane being a non-essential epiphenomenon; the other a general disease, of specific character, propagating itself by contagion, and of which the membrane is an essential condition.

> "The notion of the morbific cause, and I shall insist upon this point in treating of specificity, can alone serve as a basis for the formation of species in pathology; for we cannot build upon the knowledge of the symptoms, essentially mobile, fugacious, and common to a great number of morbid species, nor upon the lesion, although this offers something more stable and less equivocal. If in some cases the lesion appears in effect, I will not say to constitute, but to characterize the disease, often it cannot be given as the essential character. On the one hand, it may be entirely wanting, as in scarlatina, measles, and variola without eruption; on the other, either very different lesions are met with in the same disease, as in syphilis, or similar organic changes appear in the course of maladies the most opposite in nature."

This opens upon us the whole subject of the specific characters of many diseases [*spécificité*] to which the author devotes a lecture in another part of the volume. It is a subject to a correct understanding of which he attaches a very great deal of importance, returning to it again and again, stating his belief that it "rules all pathology, all therapeutics, in a word, the whole practice of medicine." We should judge such marked inculcation of this doctrine more necessary in France than here, for we are told that the doctrines of Brown and of Broussais still exert an influence upon the professional mind there, and still find expression in medical language, although it is claimed that their yoke is shaken off. He gives a very interesting sketch of the "dichotomous doctrines" of the two great teachers and leaders, the one based on incitability and the other on irritability, in both of which diseases differed almost entirely in *degree*, scarcely at all in *nature;*

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[1] Op. cit., p. 60.

a doctrine which reduced therapeutics to a simple matter of administering one class of remedies. A great deal of what he writes upon this subject is worthy of reproduction, but we have only space for a few extracts of historical interest, as connected with our subject.

> * * * "However opposed these doctrines were to each other, they rested upon a common basis, for Broussais, while he was the greatest antagonist of Brown, nevertheless derived the principles of *physiologism* from the pathological system of the Scotch reformer, whose *incitability* differed only by its abstraction from the *irritability* of Broussais."
>
> "Life, said Brown, is only maintained by *excitants;* life, said Broussais, is only maintained by *stimulants.*"
>
> "Disease consisting, according to the Edinburgh doctrine, in a greater or less degree of incitability, and according to the theory of the Val-de-Grace in exaggerated, or more rarely in diminished irritability, these dichotomous doctrines, essentially opposite, take account only of the quantity of the morbific cause, and absolutely not at all of the quality. Therapeutics founded upon such systems should be necessarily extremely simple. Thus, for Brown it was limited to the class of excitant remedies, and, in some very rare cases, antisthenics, if the term be permitted me; while Broussais had only recourse to antiphlogistics, and if he advised excitants it was in very exceptional circumstances.

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> "This was to make, as completely as possible, a clean sweep of all nosology and of all materia medica. Matters were in this condition at the commencement of this century; this doctrine, so seducing at first by its simplicity, had gained many adherents when Laennec and Bretonneau appeared and gave each in his turn a blow, the severity of which Broussais sought in vain to conceal. Laennec, under the modest title of a semiological discovery, and seeming to limit his observation to the study of diseases of the respiratory system, wrote a marvellous chapter of nosology, while in his *Traité des Inflammations speciales du Tissue muqueux*, Bretonneau effected for acute diseases the restoration which Laennec had made for chronic.
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> "Calling attention to the primordial fact that differences in the nature of the cause impress upon diseases differences far more radical than can the greater or less intensity of this cause, the illustrious physician of Tours overturned from turret-stone to foundation the grand edifice of *physiologism* and of the pretended *rationalism* in therapeutics, and upon its ruins he erected the doctrine of the specificity of diseases.
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> "In physiology he gave to the special properties of the various tissues and the various organs an importance far greater than he accorded to the modifiers of the organism; in pathology he recognized that a great number of diseases have a common element, called irritation or inflammation, but this common element has not the importance assigned to it by Broussais. Without doubt the furuncle and the malignant pustule, the syphilitic chancre, and herpes preputialis, gastric derangement, and dothinentérite, have inflammation for a common element, characterized by fluxion, by redness, when the tissues are accessible to sight, by pain, and by elevation of temperature; but in addition to this common element there are others of well-marked character which distinguish these different affections, and which are of very considerable importance."

He pursues this subject at great length, but in a manner which could not tire any reader interested in his profession; he points out analogies between these views of disease and the facts in regard to plants and animals; gives abundant illustrations from pathology, and makes very numerous practical illustrations. We have space for only one more extract applying directly to the class of diseases under consideration:—

> "An individual presents himself to you affected with sore throat; he was taken in the evening after a chill with general indisposition, backache, loss of appetite, and fever. The following day he complains of difficulty of swallowing, the submaxillary glands being but slightly engorged. Upon examining the

pharynx you find tumefaction of the tonsils, redness of the arches and veil of the palate, and upon the affected surfaces you see secretions having all the appearance of a false membrane. Suppose that at about the same time you are called to another patient also affected with a membranous angina, but in whom the affection has been differently developed. Without appreciable cause there has been for some days general indisposition without fever; his sore throat is much less painful than that of the first. If you take account only of the anatomical element common to the two affections, they resemble each other perfectly. The scalpel, the microscope, chemical analysis, would show you that in the two cases the false membranes are identical; to judge from appearances your second patient is far less ill than the first. But if you abandon the two to themselves, you will see the one, that which began with the more violent symptoms, with more pain, with a febrile reaction which was wanting in the other case, you will see, I say, this angina recover rapidly and spontaneously, and leave no trace of its existence; while the other will destroy the patient, who will succumb to a general poisoning, or to suffocation produced by the development of pseudomembranous laryngitis or croup. In these two cases you have to deal with a membranous angina, but with this difference, that the one was the common kind, herpes of the pharynx, which is generally of little gravity, while the other was the malignant membranous angina or diphtheria, which is, on the contrary, generally grave."

And it is a knowledge of this difference in the essential nature of disease, this hidden something which we know not, but the presence of which is called *specificity*, which he believes of such importance as to sway all therapeutics and the whole of medicine; it is, of course, intimately connected with, indeed a part of, the natural history of diseases, and no opportunity of impressing the value of a thorough acquaintance with this is anywhere omitted in the work.

Diphtheria is a contagious disease, *specific par excellence*, which prevails in all climates and at all seasons, and spares no age, although children are its especial subjects; its anatomical manifestation is a false membrane produced on the mucous membranes, and on the skin if denuded of its epidermis; the pharynx is the most frequent seat of the membrane, whence it spreads to the larynx, producing croup; the most common fatal termination of the disease being by the suffocation thus produced, although malignant diphtheria may kill by a general poisoning, as do other septic diseases.

The first point to engage our attention is the fact that he makes diphtheria and croup identical, a point upon which he differs again from the latest and best English writers.[1] His lectures are entitled "Diphtheritic Angina *and* Croup;" they are the same disease only as respects the location of the membrane, and that generally, in all cases of croup, the formation of the membrane began in the pharynx, and extended thence to the larynx; therefore the croup is secondary, and not primary; it is not "*croup d'emblée*," to use his own expression, a term which has been made familiar to all from its use by writers on venereal diseases in regard to bubo. In this respect the pupil follows his master, Bretonneau having taught the same doctrine; but he mentions Guersant, so many years surgeon to the Children's Hospital, as one who formerly held the generally received view, but changed as soon as his attention was called to the subject, and says "it has been the same with all, as well in Paris as elsewhere, who have taken pains to investigate the matter." Meantime—

"I do not deny the existence of croup *d'emblée*. Not only do I not deny that the pellicular disease may begin in the larynx, but I admit that, in very rare instances, it may attack the bronchial tubes first of all. Guersant and many others have cited examples. According to the report of Dr. Yvaron, in an epidemic which prevailed at Avignon during the year 1858, this primary laryngeal and bronchial diphtheria was the form it peculiarly affected. I have already recalled to your minds two cases in which the membrane appeared simultaneously in the bronchiæ and the trachea, as well as in parts accessible to sight. * * * I do not deny, then, that croup may begin in the larynx, but I maintain that the fact is rare and exceptional."

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[1] Aitken: The Science and Practice of Medicine, 3d ed., 1864. Jenner, op. cit.

Why the membrane is not generally seen in the pharynx, in cases called and treated as croup, is, first, simply because it was not looked for, and, second, because the physician is called too late, when the membrane in the pharynx has disappeared. He distinctly teaches that the false membrane may form in the pharynx, exist there one or two days, pass on to the larynx, leaving its original location entirely free, the slight intensity of the general symptoms favouring the oversight of practitioner and friends.[1]

"When you are called to a child which you are told has been suffering with croup for two days only, question the parents, and you will learn that the child has been suffering a longer time; that for five or six days he has not eaten well; that he has complained of some difficulty in swallowing; that he has refused food somewhat hard, as crust of bread; you will learn also that there has been some swelling of the neck; these are the certain indices of a sore throat, and of the past existence of false membranes which you can no longer see."

This is not limited to children, but the same is true of adults, and in them even more likely to occur and to prove disastrous, the reason given being that in them the opening of the larynx is proportionally larger and the calibre of the trachea greater, whereby the air finds sufficient passage without exciting difficulty of breathing, even after the air-tubes are lined with false membrane. The following case is given in illustration of this fact; it also shows the insidious approach of the disease, and an amount of resource and promptitude of action on the part of the author sufficient to qualify him for a backwoods practitioner, and we consider this no mean compliment:—

"I was one day, a day too memorable for me ever to forget, dining with a friend whose chateau is situated a short distance from Silles, in the department of Cher, when a peasant came for me in great haste for his wife, who, he said, was suffocating. I went to her immediately. I found a woman of twenty-six years, still clothed in her holiday garments; it was Whitsunday. She had been to mass in the morning, more than a quarter of a league from there; after returning on foot, she had dined as usual, and was even preparing to go again to vespers, when she was taken all at once with an attack of suffocation so violent that her husband feared we should find her dead upon our arrival. She was in effect expiring when I saw her. Examining her throat immediately, I discovered thick false membranes covering the pharynx. The nature of the disease was plain to me, and this poor woman being in the last extremity, tracheotomy alone could rescue her from immediate death. Without delay I set about performing it. I was alone, with no assistant but the husband, with no instrument but a penknife with a convex blade, which fortunately I had with me; then I was obliged, for want of a tracheal canula, to make a rough one of a leaden ball which I flattened with a hammer and fashioned into a sort of a tube. Unhappily the false membranes had already extended to the small bronchiæ, and the patient died the following day."

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[1] Since this article was prepared for the press, the writer has seen two cases supporting the views of the author in this respect. In one, a boy of ten years of age, seen in consultation, the membrane had entirely disappeared from the throat under the treatment and observation of the attending physician when the croupy symptoms set in; and had the history of the case been wanting, there was nothing to indicate that it was a case of diphtheria. In the other patient, a little girl four years old, the membrane disappeared from the throat, all symptoms passed away, and attendance was discontinued for two days, although a preparation of iron was continued; symptoms of invasion of the larynx then came on, and proved fatal in a few days.

In both of these cases tracheotomy was considered, and not advised; in the first, because it was believed the membrane extended too deeply, an opinion proved to be correct by the expulsion on two occasions of membranous casts of the trachea several inches long; in the other, because of the evidence of a too profound blood-poisoning, the membrane reappeared on the throat, extended forwards over the palate, and even appeared on the gums.

It is needless to follow the author in detail through the consideration of each individual symptom of the disease—of the two diseases, we should say, for croup is given as fully as diphtheria. We cannot omit, however, to transcribe the painful picture of the closing scene of croup, so faithful to the sad reality, and which has been thought worthy of quotation by other writers:—

"Meanwhile the attacks of suffocation occur nearer together, and become more and more violent, and up to the moment of dissolution there are soon no more intervals of tranquillity between them; the laryngeal whistling is continuous. From time to time the poor child, in a state of agitation impossible to describe, springs up into a sitting posture, seizes the curtains of its bed, which it tears in its movements of convulsive rage; sometimes it tears with its nails the paper from the walls; it precipitates itself upon the neck of its mother, or of the persons who surround it, seizes them, seeking to grasp everything within its reach, and find wherever possible a point of support. The next moment it is against itself that its vain efforts are directed, clutching violently at its neck, as if to tear away the obstruction which suffocates it. The face is swollen and of violet hue; the eyes haggard and brilliant, expressing the most painful anxiety and the most profound terror; then, overwhelmed with its sufferings, the child falls into a sort of stupor, during which the respiration remains difficult and whistling. Its countenance, its lips are then pale, its eyes dull. Finally, after a supreme effort of respiration, the agony begins, and the struggle terminates without there being, from this time, as severe an attack of suffocation as many which have heretofore occurred, and in which death might have been expected."

The *prognosis* of diphtheria is decidedly bad; he believes it to be almost universally fatal if uninterfered with by treatment, and gives abundant illustration of the truth of this statement. The frequency with which recovery takes place by the spontaneous expulsion of the false membrane is a point to which we turned with great interest; the author has only met with *six cases* during his long and extensive practice! The fact that such expulsion has an unfavourable influence upon subsequent tracheotomy is one not apparent, but has been learned by experience.

"It is a remarkable fact that, although the expulsion of the false membrane incontestably affords to the patient a chance of recovery, it affords less when, the recovery not following spontaneously, we are forced afterwards to perform tracheotomy. In a word, this operation is less likely to succeed in a child which has expelled false membranes than in one which has not. You will see the reason for this immediately.

"The presence of pseudo-membranous concretions in the larynx and in the trachea proves that the diphtheritic inflammation has gained these organs. After tracheotomy this propagation seems to cease. Now the expulsion of the diphtheritic membranes, in postponing the time when we are forced to interfere, permits the inflammation to spread, so that in a child which has thrown up pseudo-membranous tubes by its efforts of coughing or vomiting, and which has experienced a temporary amelioration, putting off for forty-eight hours the necessity of operating, you run the risk of seeing the bronchial tubes invaded even to their smallest ramifications; while in another child, upon which tracheotomy was performed early, before the expulsion of membranes, it will not be thus under ordinary circumstances."

Thus far the author has been treating of the milder form of the disease, the form in which it always appears when occurring sporadically, and by far the most frequent when it prevails as an epidemic. But there is another form, far more terrible by the rapidity of its course and its almost universal fatality. It is malignant diphtheria, from which the patient dies, as sometimes in cholera, overwhelmed by the fatal influence, without the disease running through its usual stages; "the general poisoning seems to take place at once, and when the characteristic concretions begin to appear upon the pharynx and in the nose, the whole economy is already profoundly altered." Fortunately this form is comparatively rare; from 1822 to 1844 the author did not meet with a case; within the few past years he has seen more than seventy in Paris alone.

As usual, in opening a new subject, the author details at length a case which has occurred in the hospital, commenting upon the treatment which has been conducted under the observation of the students. He makes two subdivisions of this form of the disease, into that which runs a *slow* and that which runs a *rapid* course. The case detailed belongs to the former. Of the second, which may be said to kill by "sideration," he gives the following sad instances:—

"One of the most deeply regretted colleagues of our hospital, whose name is widely known, and whose works are in the hands of many of you, Valleix, attended a child suffering from membranous angina. The disease, which was not very grave in character, was cured, thanks to the energetic treatment of our unfortunate brother. In examining the throat one day Valleix received into his mouth a little of the patient's saliva, expelled by its efforts of coughing; he took the disease. The next day he ascertained the existence of a small pellicular concretion upon one of his tonsils, a light febrile movement followed; at the end of a few hours both tonsils and the uvula were covered with false membranes. Soon an abundant serous discharge was set up from the nose; the glands of the neck, the cellular tissue of this region and of the inferior maxillary region became considerably tumefied; he was delirious; and in forty-eight hours he was dead, without having presented any laryngeal symptoms whatever.

"Very recently one of our professional brethren of the provinces treated a child with diphtheria and croup; he was obliged to resort to tracheotomy. During the operation blood entered the trachea, and suffocation was imminent; our imprudent confrère, affrighted, applied his mouth to the wound in the neck and drew the liquid out of the air-passages; he inoculated himself with the disease. Forty-eight hours afterwards, like Valleix, he died of malignant diphtheria, and like him, with delirium and the other accidents which I have just mentioned to you.

"What lamentable cases to receive additions! Yet in the same manner my colleague and friend, M. Blache, was so unfortunate as to lose his son, one of the most distinguished internes of our hospital, a young man to whom the future was full of promise, and in whom intellectual gifts were added to the most solid instruction. Henry Blache was placed by his uncle, M. Paul Guersant, in charge of a child upon which he had just performed tracheotomy for croup; he passed three nights with it. At the end of the third he experienced a slight soreness of the throat, returned home and made complaint to his father. Being immediately called, MM. Roger, Degroux, and myself, we found the unfortunate young man with a very intense fever, the tonsils covered with false membranes. In a few hours the swelling of the neck had become enormous, the nasal discharge was established and was incessant; at the end of the third day delirium set in; sixty-two hours after, in spite of the energy of our medication, we saw our unfortunate patient die. He succumbed without having presented the least symptoms of implication of the larynx."

Truly science has her martyrs as well as religion.

Tracing the course of the slower form of the disease, he notices the points upon which it differs most markedly from the common form; they are a greater amount of ganglionic engorgement, often accompanied by an erysipelatous redness, a more rapid spread of the false membranes, and especially the presence of the diphtheritic concretions in the nose, a symptom always of the gravest import.

> "At the end of twenty-four, thirty-six, or forty-eight hours the nasal fossæ are invaded. The existence of concretions in these cavities is a most serious fact. to which I called your attention when speaking of our little patient in the St. Bernard ward. Bear it in mind, gentlemen, for when it appears, even in the form apparently the most benign in the beginning. you will very rarely see the patient, either child or adult, recover. Of all the manifestations of the disease, I have said it, I repeat it, and insist again upon this capital fact, that which is shown on the olfactive mucous membrane is the most alarming. Of twenty individuals affected with nasal diphtheria, nineteen will succumb, while of twenty affected with croup, we can save a certain number by tracheotomy, as I hope soon to show you."

The gravity then of malignant diphtheria can scarcely be exaggerated; of the slow form some may be saved, although it is "more grave than typhus, than cholera, or than yellow fever." The other form is pitiless in its fatal course.

We must not omit to mention some facts he gives in regard to the *inoculability* of the disease. After stating its undoubted contagiousness, he says the possibility of transmitting it by inoculation is doubtful, but he rejects all experiments upon animals as being valueless in deciding the question. He then gives the following negative facts. But do they not illustrate the well-known truth that besides the *materies morbi* of contagion or inoculation there must be a certain condition of the recipient? The seed will not sprout if it does not fall in fertile soil. After the case of the provincial surgeon, already quoted, it would not seem necessary to repeat such experiments.

> "I attempted, in 1828, to inoculate myself with the disease by puncturing the left arm, the tonsils and the veil of the palate, with a lancet dipped in a false membrane which I had just taken from a diphtheritic wound. and did not give myself diphtheria. In the excellent memoir of M. Peter, which I have often quoted to you, he states how he three times tried the same experiment upon himself, but without result. The first time, while performing tracheotomy upon a child, he received upon the cornea of the left eye a semi-liquid pseudo-membranous production which covered the organ for an instant, and of which the more fluid portion bathed the inside of the lids; he did not wash the eye, and no evil result followed. The second time he made three punctures upon the lower lip with a lancet covered with semi-fluid diphtheritic exudation, and he experienced no derangement of his health. The third time, finally, this daring experimenter brushed over the tonsils, the pillars and velum of the palate, and the posterior part of the pharynx with charpie charged with diphtheritic matter, and this time, too, the result was negative. It may be then. gentlemen. after these experiments, that diphtheria is no more inoculable than scarlatina and hooping-cough, diseases of which no one, however, doubts the contagious nature."

We pass on to the treatment of diphtheria and croup. First of all the antiphlogistic treatment is decidedly rejected, and the author seems more anxious to impress this point because the current doctrine having been that the local disease is inflammatory in nature it would seem rational that it might be extinguished by bloodletting. But here again he brings in his doctrine of specificity. Inflammation there undoubtedly is, but depletion can no more stop its course than it can the inflammation which attends upon a pustule of variola. He says plainly that long experience has demonstrated to him that antiphlogistic measures are not only useless but injurious.

He rejects also alterative medication, an annex of the antiphlogistic. His remarks upon mercurials, the principal medicines of this class, and their double mode of action, cannot but be interesting, considering the high standing of the author as a writer upon therapeutics. It will be seen that he distinctly recognizes the power of mercury in controlling inflammation, a power which has been of late years repeatedly questioned and denied.

> "Among the agents of alterative medication, mercury and its preparations occupy an important place. The mercurials, as you know, are considered the most powerful antiphlogistics of the materia medica, and perhaps their power is even greater than that of bloodletting. You have a hundred times seen the effects which we obtain with them in certain phlegmasiæ of the serous membranes; you do not forget that their happy influence over these inflammations, very grave by their extent, their seat, or by the febrile reaction excited, has been extolled. Well; the mercurial preparations, calomel given internally, the mercurial ointment applied to the skin, have been tried in England, in Germany, in America, and in France, under the name of antiphlogistics, in the treatment of diphtheritic affections—membranous angina and croup. The results, I must say, have been often happy. Without resorting to any other medication, calomel administered *fractâ dosi*, according to the method of Doctor Law, has cured a certain number of patients.
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> "This, gentlemen, would seem in contradiction with the proposition I have just laid down in regard to the dangers of the antiphlogistic treatment; the fact is, the question is a complex one. Calomel, and indeed the mercurial preparations are an *argumentum bis feriens*. Mercury has two modes of action: on the one hand it has a general action upon the economy, and in this respect it is an alterative, an antiphlogistic; on the other hand it has an action exclusively topical. When you prescribe lotions of a solution of corrosive sublimate to the skin, when you drop into the eye mercurial collyriæ, or apply to the lids preparations of red precipitate or of the mild chloride, when you fumigate with cinnabar, your treatment is exclusively local, and it is only indirectly that you obtain general effects; you are applying substitutive medication. It is only later, only by persevering in this treatment that the mercury acts upon the composition of the blood and modifies it, as do all alteratives. Now, so far as it acts as a topical agent the protochloride of mercury appears to me to be of real utility in the treatment of diphtheritic affections. Applied to wounds which are the seat of pseudo-membranous exudations it modifies them advantageously, and if it has rendered any service in diphtheritic angina, it has been by acting in the same manner. When it is administered in fractional doses (five centigrammes, gr. .77, mixed with four grammes of sugar, and divided into twenty powders, one to be taken every hour), to an individual suffering with diphtheria, it goes mixed with the saliva, to traverse the pharynx, touch the affected surfaces and modify them as it modifies wounds upon the external surface. I do not deny, however, the general action which may follow; absorbed from the digestive passages it produces considerable effects; it modifies the blood by augmenting its fluidity, and puts it in such a condition that the secretions are less plastic than they were before. So little do I contest this general action that I dread it, and the topical action appears to me alone useful. In truth, when we limit ourselves to repeated mercurial frictions we bring about very quickly this peculiar dyscrasia of the blood, we determine the phenomena which depend upon it, we produce salivation, and meantime, in these cases, we do not cure the angina. Further, by reason even of this general action upon the economy the mercurial treatment has its dangers. Its effects varying according to individual predispositions we run the risk of seeing it pass beyond the limits to which we would restrain it, and in these circumstances we find again the disadvantage of the antiphlogistic

plan, which, if it does not directly aggravate the malady, prolongs convalescence by augmenting the debility into which, I repeat, the patient will be thrown by the very existence of his disease."

The bicarbonate of soda having been advanced as a specific for this disease, its claims are examined and its value as a remedy, to say nothing of specific power, is denied.

The chlorate of potash is a medicine of more importance and character. He sketches its discovery, its introduction into practice, its fall into forgetfulness and its revival. He is very guarded in his expressions as to its value in diphtheria, and his conclusions far from justify the popularity of the medicine with us. Facts have seemed to favour its utility, but it is far from being a reliable medicine, and, if seemingly efficacious in cases of medium intensity, he denies its power over those of grave characters.

"When in these cases it has been exclusively employed, I have constantly seen it fail; employed conjointly with other medicines it has seemed, without it being possible for me to affirm it, to have an effect really advantageous. What I say of membranous angina applies even more strongly to pseudo-membranous laryngitis. Without doubt cases can be cited from time to time of croup cured by chlorate of potash; but these observations can never be convincing, for the reason that generally the medicine has been associated with others, particularly with emetics, which of themselves will sometimes explain the success. However, as this medicine has the reputation of exerting a general influence upon the organism and opposing the reproduction of plastic exudations, as none of the disadvantages attach to it which I have mentioned as belonging to the alkalies and the mercurials, there is nothing against having recourse to it in so dreaded a disease. Guard, however, against having too much confidence in its virtues; guard, above all, against employing it to the exclusion of other remedies, the efficacy of which has been demonstrated by experience."

Bromide of potassium and bromine are next considered; they have been recommended highly, but by one who "in his practice follows a way which is not ours, and which, therefore, compels doubts;" nevertheless he recommends a trial of these medicines under proper circumstances.

Sulphuret of potash and the polygala senega have both had their day of popularity, but have both been abandoned.

He next considers modes of treatment which may be termed indirect; they are *emetics* and *revulsives*. The former have two modes of action: an antiphlogistic, shown by the relaxed and depressed condition during the state of nausea as well as during vomiting; and a mechanical, clearing the air-passages of concretions which obstruct them by the efforts of retching. The former part of their action he of course considers injurious; the latter is, as far as it goes, beneficial. Emetics are not, however, very reliable in diphtheritic affections, in his opinion; their reputation has been gained in false croup, where their antiphlogistic action is sufficient to extinguish the inflammatory element of the disease, and he refers to Valleix's *Guide du Médecin Practicien*, for a confirmation of his opinion upon this point.

"But however useful the emetic plan of treatment may be in some circumstances, do not accord it too great confidence. After a tolerably long practice, after having seen a large number of patients, both children and adults, suffering from diphtheritic angina and croup, I can state that the failures of this plan very far outnumber the few cases of success I have witnessed. And even after having given emetics, and having obtained a notable amelioration of the accidents for which you prescribed them, never forget that these accidents will manifest themselves again; often, within a very brief space of time, the difficulty of respiration, the attacks of suffocation which you have caused to disappear will appear again, because new false membranes will have been formed. If once again you are fortunate enough to cause their expulsion, a third time the same means will fail you, and take care that you do not, by too frequently producing nausea, throw your patient into such a state of depression that he can no longer struggle against the disease when it shall be necessary to have recourse to tracheotomy."

In regard to the revulsive plan of treatment, we will not quote his remarks at length, because we do not believe it is followed in this country sufficiently to make his reprehension necessary. He not only rejects blisters *in toto*, but ridicules the idea that they can possibly be of any service; as well blister the neck of a child into whose trachea a bean has passed; and not only this, but the tendency to the formation of false membranes on the blistered surfaces complicates the case, and adds to the chances against the patient's recovery. In connection with this subject, he quotes our countryman, Samuel Bard, as he does upon several other points.

He then arrives at *topical medication*, which he tells us is the treatment *par excellence* of diphtheria, notwithstanding much opposition which it has encountered. Astringents and caustics are the agents of this medication, and they have been employed from time immemorial. Aretæus used alum and powdered gall-nuts, and taught that the disease should be combated with remedies "similar to fire." Yet these remedies fell into forgetfulness; they were not used at all during the epidemics of the seventeenth and eighteenth centuries; and, singular to say, Bretonneau, "who knew better than any one what Aretæus had written of alum," thought but little of this astringent even at the time he published his *Traitê de la Diphthérite;* it was not until he learned its powers from Trousseau himself, that he gave it his confidence; and then follows a most interesting account of the author's acquaintance with the remedy, which we should like to give in full, but must condense it. Briefly, then, diphtheria was raging in one of the departments, and he went to the seat of the epidemic to observe and study it. He there learned from the pastor that the disease had ceased to be as fatal since the patients had been treated by an innkeeper's wife, who had enjoyed a local celebrity as an eye-doctor. Her remedy was a secret, but Trousseau, visiting her patients, to observe the disease, soon found it to be a solution of alum in vinegar and water; she confessed its nature, and said she had used it because of its beneficial effect in a disease of pigs, characterized by white patches on the mouth, and the resemblance of this disease to diphtheria had suggested the use of the same medicine.

"I communicated my documents and the facts which I had observed to the prefect of the department; this mode of treatment was published, and sent to the different communes; I also gave an account of what I had seen to Bretonneau, who has since then had recourse to alum, and it is now used by physicians everywhere."

Tannin is another medicine, used by Aretæus as powdered galls, which the author used in almost every case, sometimes alternating it with alum, and he applies them in the selfsame way followed by the ancient physician; they are blown into the throat through an elder-tube or a roll of paper, the insufflations being repeated every two, three, or four hours.

The author has so much confidence in this astringent medication, that he would not resort to any stronger local applications, could he be always sure of their thorough application and of his directions being followed. Passing on to caustics, however, the first he mentions is chemically pure muriatic acid, applied three or four times during the twenty-four hours.

It is preferable to the nitric or sulphuric acid, because its action does not extend beyond the part touched any more than does nitrate of silver; it has, however, one inconvenience; it produces upon the mucous membrane to which it is applied a membrane so similar in appearance to the diphtheritic exudation as to be scarcely distinguishable from it.

The solid nitrate of silver has been more frequently used than any other caustic since Bretonneau popularized its use. It is liable to the same objection as muriatic acid; an objection which is obviated by using the solution, which the author therefore prefers, of the strength of one part of the chemical to three of water; with the solution is also gained a far wider range of application, up behind the veil and arches of the palate, down to the epiglottis, and the opening of the larynx.

A saturated solution of sulphate of copper is also used in the same manner.

All these remedies find their application in croup as well as in pharyngeal diphtheria :—

"A child begins to have a croupy cough; he has not the croup yet; the pseudo-membrane is not yet formed in the larynx, there is only a commencing diphtheritic inflammation, but before twenty-four or forty-eight hours have passed away the false membrane will exist; the point is to prevent its production by modifying the diseased action which gives origin to them, by the application of caustics carried to the superior orifice, or even into the interior of the larynx itself."

Bretonneau and the author blow in alum continuously until the child forced to make a deep inspiration, draws the powder into the air-passages Caustics are also applied by the sponge probang. To the plan of cauterizing the larynx proposed by Dr. Green, of New York, the author prefers that of his countryman, Loiseau, which was first used by Dieffenbach, at Berlin. The forefinger of the left hand is armed with a metallic finger-stall which leaves the ungual phalanx and last articulation free; this finger is then introduced into the throat, the epiglottis is raised, and caustics can be applied by injection, insufflation, or by the saturated sponge. Favourable testimony is given of this plan, but evidently the author has not personally followed it to any great extent.

Perchloride of iron is another remedy for which specific power over diphtheria has been claimed. The virtues which have been claimed for it cannot be accorded; meantime it has rendered good service as a caustic in concentrated solution to parts covered with exudation, and internally; in the latter way its great solubility gives it an advantage over other preparations of the same metal.

But local treatment is not all; there is, as well, a general treatment.

"This treatment should be essentially tonic and reparative, as in all diseases where the powers of the economy seem to be primitively troubled and depressed. *Alimentation* here occupies the first rank, and the graver the disease the greater necessity for the nourishment of the patient. One of the most alarming signs in regard to prognosis is want of appetite, the distaste for every kind of nourishment. We must seek to overcome this by all means, and, in order to succeed, I do not hesitate to resort sometimes, in the case of children, even to threats. So long as the appetite is retained there are great chances for recovery. There can be nothing fixed in regard to the selection of aliments. We are often obliged to satisfy the strangest caprices of taste. When in diphtheria there is difficulty and pain in deglutition, I give the semi-solid substances, thick soups, pulpy substances, chocolate, cream, eggs, etc., and, as soon as I can, proceed to more reparative animal nourishment.

> "The pharmaceutical agents which I make use of are the preparations of cinchona and of iron. I give generally the powdered yellow bark, in the dose of one to two grammes [gr. xv—ʒss] in a cup of coffee, so as to cover its bitterness and facilitate its ingestion. For those who cannot take this preparation, and when I wish to obtain a more prompt effect, I substitute the sulphate of quinia for the powder of cinchona, given in the same way, in coffee. I give also the wine and the syrup of cinchona.
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> "As to the ferruginous preparations, I choose the more soluble; the perchloride, of which I have just spoken, the syrup of the citrate, or of the tartrate of iron."

All medical means having failed, tracheotomy yet remains for those cases in which the membrane has extended to the larynx, or, according to the doctrine generally received by us, those cases in which it formed only there—membranous croup. We turn to what the author has to say upon this subject with an interest commensurate to the part he played in introducing the operation and to his experience with it. In his historical sketch, containing a long record of unsuccessful attempts, he accords the honor of the first certainly successful case to his master, Bretonneau, and claims the second for himself. This was in 1833; since then he has operated more than two hundred times with success in more than one-fourth of the cases. In one of the Parisian hospitals, he states the successful cases at more than one-fifth; a fair result, considering the social condition of those who apply there for relief, the malpractice the patients have experienced from injudicious friends, and the advanced stages of the disease in which many of them are brought in. In private practice he thinks that one-half of the patients operated on should be saved, and claims that it offers so good a chance for the rescue of life as to make its performance a duty, and not a matter of choice.

With an apology to the surgeons, he describes the instruments and the steps of the operation, "an operation which physicians are more frequently called upon to perform than surgeons."

The instruments are a sharp and a probe-pointed bistoury, two blunt hooks, a dilator, and the double canula. The dilator resembles a pair of curved dressing-forceps with extremities bent outwards, and is used to open the wound in the trachea and facilitate the insertion of the canula; he considers it indispensable, having lost but one case under the operation, and that he attributes to the want of this instrument; blood flowed into the trachea during the efforts to introduce the canula, and suffocated the patient before the difficulties could be overcome.

The different steps of the operation do not differ from those ordinarily described in the text-books; the following remarks are, however, too important to be omitted:—

> "I cannot insist too strongly, gentlemen, upon the necessity of dividing the tissues layer by layer, of drawing away the muscles and the vessels with the blunt hooks, of well baring the trachea before opening it; I insist upon the absolute necessity of operating *very slowly*. If even during the operation the child suffocates, stop a little while, allow him to struggle, let him up on his seat, and give him time to catch his breath. This will be perhaps a minute or two lost, but there is nothing to fear. I have never seen *too great slowness* cause an accident, and I have often been a witness of the difficulties and the dangers of a *too rapid* tracheotomy, even when performed by a skilful operator.
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> "I oppose, then, with all my power, the rapid mode of operating recommended by M. Chassaignac, which consists in fixing the larynx by means of a tenaculum, and penetrating the trachea directly by a thrust which passes at once through the skin and the deeper parts. [Here follows a historical sketch of this mode

of operating, with mention of its adherents and opposers, from the time of Sanctorius (1586) to the present time.] Paul Guersant once followed the speedy method; but now, although he operates more rapidly than any of us who are not surgeons, he proceeds slowly enough to avoid the grave risks which I will mention to you. On the one hand, there is danger in fixing the larynx, for, in opposing movements upon which depend the exercise of a function already seriously compromised, you run the risk of accelerating asphyxia and death; on the other hand, you are likely to occasion fatal hemorrhage should your instrument, by chance, come in contact with arteries abnormally distributed, as occurred in a case communicated to me by M. Richet. In a little girl upon whom he operated for croup, just as he was about to open the trachea, he was obliged to divide an artery almost as large as the radial; it was an anastomosing branch of the two inferior thyroids. A ligature applied to the two extremities arrested the hemorrhage, and on this occasion this skilful surgeon had once more to felicitate himself upon the slowness with which he habitually proceeds in tracheotomy. In another case I found the left carotid arising from the innominata and crossing the trachea. Further, not only is it less easy to puncture the trachea through the skin than at the bottom of a wound, but the instrument may deviate and enter the œsophagus instead of the air-passage, as once happened to our colleague, A. Bérard. Finally, if, at the moment the canula is introduced, a false membrane lining the trachea opposes an obstacle to this step of the operation, how are you going to seek for it through a narrow and deep wound? how can you see it in the midst of the blood? Death will be then inevitable."

In illustration, he details an interesting case in which a false membrane was pushed down before the entering canula, and produced symptoms of immediate suffocation, when, happily, it was seized and withdrawn.

There are some points of the after-treatment to which he attaches very great importance; if too much stress appears laid upon them, he apologizes by saying, "The more I advance in age the more I am convinced that in therapeutics the minutiæ hold a far more considerable place than is generally believed." The principal of these is the surrounding the neck and canula with some knitted woollen fabric, so that the patient inspires air warmed and moistened by respiration.

There remains the question of after-treatment:—

"This subject, entirely medical, is so important that it henceforth rules everything, and while some lose their patients almost invariably, others save a third or even half of them. I should do wrong to speak only of the treatment to be followed; we must also take fully into account that which has been prescribed. Let us say at once, for it is the truth, that the majority of physicians are now, happily, agreed upon the point that the general medications of which I have spoken to you are often useless; even that the chances of success will be as much greater as these medications have been less energetic; that, above all, vesicatories have the great evils which I have pointed out to you: the result is that they do not exhaust their little patients by bloodletting, that they take good care not to apply blisters. For my part, I am firmly convinced that if we have been more fortunate with tracheotomy during a certain number of years past, it is due to the better direction of the preceding treatment instituted by our confrères.

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"The operation performed, the first thing to which the physician should direct his attention is *alimentation*. I have, gentlemen, several times insisted upon this point; alimentation is the remedy *par excellence* in the majority of acute diseases, and above all in the diseases of children. It is certain that abstinence, prescribed by Broussais, and still adhered to by a great number of physicians who, not being able to shake off the old man, retain too many prejudices of their early medical education, abstinence is one of the gravest complications of diseases, the best calculated to maintain the infected condition of the economy, the best calculated to favour the absorption of external miasms, and of vicious secretions produced in the system, the most contrary to that power of resistance which is the great moving force of convalescence and of definite cure. I do not say that it is necessary to gorge the little patients with food; I only say that it is necessary to satisfy their appetite if they have any, and to force them to take food if they will not take it otherwise. * * * * *

"What I have just said indicates that I proscribe, in the most formal manner, a continuation of those means which, before the operation, were judged more or less appropriate—calomel, alum, emetics, and purgatives—which could not be compatible with the alimentation which I advise."

Then follows the statement of a "remarkable fact," which seems to us additional evidence that croup is not always merely laryngeal diphtheria; for if so, and if diphtheria be a general disease, why the difference between its external, or cutaneous, and internal manifestations?

"A remarkable fact is that tracheotomy once performed, no further attention need be bestowed upon the pharyngeal or laryngeal manifestations which before demanded such vigorous treatment; they cure themselves. It seems as if the disease, having arrived in the air-passages, had exhausted all its powers, and as if, in giving inlet to the air by tracheotomy, the patient be prevented from dying, the cure would follow naturally. I speak of the pharyngeal and tracheal manifestations, for the cutaneous manifestations should be still most thoroughly treated by the topical measures I have indicated, under penalty of seeing them become the occasion of unhealthy absorption and of a general infection which should be prevented at every hazard."

Having completed at very considerable length the details of dressing and of after-treatment, he arrives at the important question of the best time for the performance of the operation.

"I wrote, in 1834, and repeated, in 1851, 'So long as tracheotomy was an unreliable measure in my hands, I said operate as late as possible, but now that I can rely upon a fair prospect of success, I say operate as soon as possible.' In removing from this statement what may appear too absolute, I still maintain the proposition in saying that *the chances of success of the operation are great in proportion to the early period at which it is performed.* The ingenious experiments of M. Faure have demonstrated that in slowly and methodically asphyxiating an animal, clots form in the heart and great vessels during the last moments of life; the operation should therefore be performed before death is imminent; but I hasten to add that, at whatever degree the asphyxia may have arrived, the child having but a few minutes to live, tracheotomy should be performed; it has a chance of success *when the local lesion, when the croup, constitutes the principal danger of the disease.*

"This restriction is important, for if the diphtheritic infection have profoundly affected the economy; if the skin and the nasal fossæ are attacked by the specific inflammation; if the frequency of the pulse, the delirium, and the prostration indicate a profound poisoning of the system; if, in a word, you have to deal with the malignant form of diphtheria in which the peril is rather in the general state than in the local lesion of the trachea or larynx, *the operation should not be performed;* it is invariably followed by death."

The predominance of the symptoms of asphyxia over all others are at once the guide to the operation and the conditions of its success.

Finally, there is the influence of age upon the success of tracheotomy. It is less likely to prove successful in adults than in children, for reasons already given; in infants it offers but little chance of saving life; the author has seen but two successful cases under two years of age, one at thirteen months, the other at only six days less than two years. He reports some few other instances of success under the second year, but such cases are rare. He still thinks, however, that the patient should have whatever chance the operation affords without reference to its age, except, of course, in regard to prognosis.

With this we must close the subject chosen for examination. But it would be injustice to the author if we did not state that we have not touched upon many points of interest which are fully considered by him. The state of the blood, the diverse localizations of diphtheria, albuminuria and diphtheritic paralysis are some of the most important. The latter is one of the most interesting subjects connected with the disease, and its consideration occupies twenty-six pages of the work.

We must also close our review. We should, perhaps, have more fully attained the object of such an undertaking had we viewed the work more as a whole, examined it more critically throughout, and compared it closely with other works of similar aim and character. This we should have done had it been in our own language, and accessible to those who read our remarks; as it is not, we have thought the interest of our readers best subserved by presenting brief portions of the work, and the object of giving information as to the book and its author best attained by extract rather than by comment. If we have confined our attention too much to a limited portion of but one of the three volumes, our apology will be the better opportunity afforded for individual judgment by a pretty thorough presentation of his mode of dealing with one class of diseases, and an acquaintance with the author himself, as direct as the medium of translation will allow.

We close our task with regret. It is not often that such a work, by such a man, is presented to the medical world. The crowning effort of a lifetime of labour in the pursuit of the best means of curing disease, the production of an acute observer, an untiring worker, an experienced teacher, and a talented writer, it stands a shining light in medical literature, and a lasting monument to the fame of the author, rivalled only by such works as those of his great model Graves, or of his countryman, Andral.

J. C. R.

ART. XVI.—*Lectures on the Pathology and Treatment of Lateral and other Forms of Curvature of the Spine.* By WILLIAM ADAMS, F. R. C. S., Surgeon to the Royal Orthopædic and great Northern Hospitals, &c. &c. Delivered at the Grosvenor Place School of Medicine in the Session 1860–61. Illustrated by Five Lithograph Plates and Sixty-One Wood Engravings. 8vo. pp. 334. London: John Churchill & Sons, 1865.

THE subject of *lateral curvature of the spine* is one of great practical importance. It is of frequent occurrence, and its results are serious. It not only produces deformity, but it impairs the general health of the patient, either by causing pain or by interference with the functions of the important organs contained in the thorax and abdomen.

This volume of Mr. Adams contains a revised course of seven lectures, delivered in 1860–61, and published shortly afterwards in the *Medical Times and Gazette*, together with four lectures, hitherto unpublished, which have been added in order to render the subject more complete in all its details. The main object of the author is to establish the treatment of spinal curvature upon a more exact knowledge of its pathology. His work differs, therefore, from most others upon this subject, inasmuch as it has not been written for the purpose of bringing into notice, or of eulogizing some particular mode of treatment.

As a correct knowledge of the pathology of a disease is the only sure foundation for the proper treatment, and as Mr. Adams has well accomplished the main object he had in view in this work, more satisfactorily, we believe, than any other writer on the subject, we purpose to lay before our readers a full analysis of his volume.

The first two lectures contain some general observations upon the subjects of the book, and a sketch of those peculiarities in the anatomy and the physiology of the vertebral column which have a special interest in relation to the production of lateral curvature. There are some points in respect to the anatomical construction of the spine in which Mr. Adams differs from most anatomists. He doubts the existence of a lateral curve in the dorsal region as a normal condition of the spine, and the normal antero-posterior curves are stated to materially weaken the vertebral column. As is well known, a curve is described by anatomists, situated at the level of the third, fourth, and fifth dorsal vertebræ, and is attributed generally to the presence of the aorta. Mr. Adams opposes this almost universal belief, not only from examinations of the living but from numerous and careful observations on the dead subject, a better test, insomuch as in all lateral curvatures of the spine the deviation of the bodies of the vertebræ is much greater than that of the spinous processes. This point in anatomy is important, as a belief in the existence of a slight lateral curvature as a normal condition would lead, in a particular case, to an unsound opinion in practice. Of this Mr. Adams has recorded an example at page 25. This matter can only be determined by very accurate anatomical investigation. That the spine is weakened by the antero-posterior curves seems to us questionable, for it is demonstrated in physics that of two columns, equal in all other respects, the one presenting alternate curves will better resist vertical pressure than one that is rectilinear, by reason of the decomposition of motive force that takes place at every curve.

Mr. Adams is very careful to show that there is no anatomical analogy, so far as the mechanism of motion is concerned, between the spine and the movable articulations of the extremities. This was the more necessary, for many writers have traced out analogies between the curvatures of the spine and the deformities that occur at these joints. The spinal muscles, Mr. Adams believes, are in the state of least activity in the erect position of the spinal column, and that their functions are not to produce by active contraction any flexion or curvature of the spine, but essentially to regulate and limit its movements, and to restore the equilibrium of the spinal column when disturbed. No ligaments exist, though spoken of by some writers, which, by contraction or relaxation, could cause curvature of the spine. At the sides of the vertebræ are only to be found some short and irregular ligamentous bands, interlacing and crossing over the intervertebral cartilages. It is by the articulating processes that the lateral and the antero-posterior motions of the spine are checked. Lateral curvature cannot take place without some alteration in form of these processes, and there is always accompanying it horizontal rotation of the bodies of the vertebræ. These points in the anatomy and physiology of the spinal column are of the very highest importance in the treatment of lateral curvature. If they are true, as we believe they are, the muscular and ligamentous theory of the production of the deformity must be erroneous, and the modes of cure based upon it should be abandoned.

The third lecture is on anterior and posterior curvatures of the spine, and is a good practical essay on these deformities.

The fourth and fifth lectures are on the external characters and morbid anatomy of lateral curvature. They are the most important chapters in the volume, and indeed give to it its particular value. The same subjects are nowhere else treated so satisfactorily, and it is only by an accurate knowledge of them, that the principles of treatment applicable to the different classes of cases of curvature that present themselves to us in practice, can be determined.

According to the generally received opinion as to the mode of production of lateral curvature, this deformity is supposed to depend primarily and essentially upon muscular debility with a lax condition of the ligaments of the spine; structural changes in the bones and intervertebral cartilages are believed to take place only at a late period.

In cases of muscular debility lateral curvature is sometimes simulated, and a certain proportion will terminate in true lateral curvature, when this is not prevented by proper treatment. Mr. Adams, however, is positive that lateral curvature as frequently exists in individuals who do not exhibit any indications of muscular debility. Such cases are described by Mr. Adams as *weak spines, or cases of threatened lateral curvature.* They are chiefly interesting in reference to the treatment to be adopted rather than in their pathology. There can be little doubt that *cures of spinal curvature* have been largely derived from this class of weak spines, a curvature being assumed when no real curvature existed.

Mr. Adams maintains the opinion that any case of curvature of the spine, properly so called, however slight it may be, is always accompanied by structural changes; the bodies of the vertebræ are deviated laterally in a horizontal direction, and the oblique articulating processes are altered in their direction and aspects. Moreover, he demonstrates that there may be curvature affecting the bodies of the vertebræ, sometimes very severe, when posteriorly the apices of the spinous processes are very slightly, and sometimes not at all deviated from a straight line.

Rotation of the bodies of the vertebræ has already been described by writers on spinal curvature, but this condition is regarded as a late change, a complication, or a superadded condition. Mr. Adams teaches that rotation takes place at the beginning, and forms an essential part of a series of structural changes, and that the external lateral deviation occurs subsequently rather than previous to the rotation movement.

The means of detecting by external characters this rotation of the bodies of the vertebræ are very carefully described. These characters vary, of course, according to the form and situation of the curvature. When a single curve[1] exists in the lumbar region, a prominence of the crest of the ilium, caused by the sinking in of the abdominal walls, corresponding to the concavity of the curve, is the most conspicuous external indication. On the side of the convexity the spinal muscles are pushed outwards. A lateral deviation of the apices of the spinous processes seldom exists in a marked degree.

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[1] It is, of course, anatomically impossible that any such condition as a SINGLE CURVE can exist. A second curvature forms simultaneously, for the purpose of maintaining the equilibrium of the body. It is not, however, externally apparent in all cases.

When a single curve exists in the dorsal region, it generally involves a considerable length of the spinal column. The symmetrical form of the body is more disturbed in this than in any other form of lateral curvature, in consequence of the length of the curve and its relation with the thoracic parietes. The level of the shoulders is conspicuously altered, even when the curvature is slight, and as it advances one shoulder becomes permanently elevated and the other depressed. The scapulæ are unequally distant from the spinous processes, that on the convexity being more distant than the other, and also raised above the level of the opposite bone. A posterior projection of the angles of the ribs, on the side corresponding to the prominent scapula, and a depression of the angles of the ribs on the opposite side, are always found, and as the curvature increases becomes one of the most conspicuous of the external characters. The ribs become more oblique in their direction, and depressed laterally as well as posteriorly in the concavity of the curve, so that the chest sinks in and becomes obviously depressed; on the convexity of the curve the ribs are more horizontal in their direction, and more widely separated from each other, than in their natural condition. The apices of the spinous processes present a more marked lateral deviation in this than in any other form of curvature, though, even in severe cases, they afford but a very imperfect indication of the extent of the internal curvature as it affects the bodies of the vertebræ. In slight cases, though the other external characters are sufficiently well marked, the lateral deviation of the spinous processes may be scarcely perceptible.

When the curve exists in the upper and middle portion of the dorsal region, it gives a high-shouldered and short-necked appearance, and produces a disposition to stoop. The scapula on the side of the convexity is tilted forwards, and the position of the trapezius muscle just above the scapula is often very prominent, so much so as to be occasionally mistaken for fatty or cystic tumour, or a chronic abscess. This same error in diagnosis has also occurred in cases where the lumbar muscles have been remarkably prominent. The sensation of fluctuation in these muscular swellings is exceedingly deceptive.

In double lateral curvature, when the curves are only of moderate extent, and about equal to each other in length, very little external deformity exists; much less than when the curvature is single. The curvature, as affecting the bodies of the vertebræ, may be very severe, when the lateral deviation of the apices of the spinous processes is very slight. In the dorsal region, however, the natural posterior projection of the spinous processes is diminished or lost, so that a flattening exists in place of a convexity, and in more severe cases the natural curvature is to some extent reversed. A posterior projection of the angles of the ribs, on the side of the convexity of the curve, and a posterior projection of the scapula, on the same side, are constantly present. The projecting scapula, moreover, is more distant than its fellow, from the spinous processes. On the side of the convexity of the curve there is a sinking-in, or depression, of the angles of the ribs. The form of the chest may not be perceptibly altered in these cases, when slight, but generally, the breast on the side of the concavity is more prominent than the other. In the lumbar region the spinal muscles are rendered prominent on the convexity of the curve, from the projection of the transverse processes of the lumbar vertebræ, caused by the horizontal rotation of the vertebræ that always takes place.

We have presented this *résumé* of the description of the principal external characters of spinal curvature, given by Mr. Adams, because we have never seen elsewhere these means for detecting lateral curvature so well described. It is indeed generally supposed to exist only when the apices of the spinous processes are deviated from a straight line.

In considering the morbid anatomy of lateral curvature, Mr. Adams shows that the curvature depends upon alteration in the relative thickness of the intervertebral cartilages and the bodies of the vertebræ at parts corresponding to the curvatures, that the bodies of the vertebræ are turned round horizontally, and that these alterations are associated with changes of direction in the articular facets of the oblique articulating processes. It is this spiral twist of the spine that produces the posterior projection of the transverse processes, and of the angles of the ribs, just described among the external appearances, which are more certainly to be relied upon as indicating the existence of internal curvature than any curvature in the spinous processes. The structural changes in the cartilages, irregularly compressed, when examined microscopically, are found to be essentially of an atrophic and degenerative character. The texture of the bones, examined in the same manner, presents no unhealthy appearance. In certain places it is more close and compact; change of a reparative character, and calculated to arrest the progress of the curve. The oblique processes are altered in form and direction, and present a nodulated appearance around the margins of the articular facets; changes apparently similar to those by which the articular extremities of the long bones become enlarged in what is called "chronic rheumatic arthritis." The transverse processes are not only altered in direction, but they are also materially altered in form. They may become attenuated and project backwards; or, when resting on the crest of the ilium, they may become flattened from above downwards. These changes Mr. Adams believes to always occur; and, moreover, he does not believe that they are associated with or depended upon a rachitic condition of the patient. He draws a broad line of distinction between rachitic and other classes of lateral curvature; a line that cannot be too broadly drawn, for the rachitic is the only form associated with deformity of the pelvis, and therefore the only form in which danger in child-bearing need be apprehended, or any obstacle to marriage assigned upon medical testimony. No case is rachitic when there is no curvature of the leg bones, or other bones of the skeleton, no enlargement of the epiphyses, nor rachitic conformation of the skull.

The influence of lateral curvature upon the structure of the chest and of the pelvis, and in causing displacement of the thoracic and abdominal viscera, and compression of the spinal cord and nerves, is considered in detail, but we find nothing here to note particularly. In all the dissections he has made of severe cases of spinal curvature, Mr. Adams has found the muscles on both sides of the spine much wasted, pale in colour, and in more or less advanced stages of fatty degeneration. This condition of the muscles he believes to begin in those of the concavity of the curve, those on the convexity wasting at a much later period.

The six remaining chapters of this work treat of the mode of production of lateral curvature, its symptoms, diagnosis, prognosis, and treatment. The peculiar opinions held by Mr. Adams upon these several subjects being, of course, deduced from those held by him in regard to the anatomy and physiology of the vertebral column, and the morbid anatomy of lateral curvature, of which we have just given a full analysis, may be readily understood.

The muscular theory of the production of lateral curvature, which is the theory generally received by the profession, is rejected on anatomical and physiological grounds, and also a sbeing contradicted by facts that have come under his own observation and experience. For the same reasons he rejects the opposite theory of active muscular contraction, held by M. Guérin. That of Dr. Dods, who attributes lateral curvature to frequent and protracted voluntary muscular effort, is rejected for the same reason, and also as altogether insufficient to explain the phenomena of rotation, which Dr. Dods taught followed lateral curvature, instead of preceding it, as is really the case.

The practice of tight lacing, to which so much is attributed by many writers, above all, be it said, by those who write for the public eye, is not believed by Mr. Adams to have any injurious influence whatever in producing lateral curvature.

According to Mr. Adams, the immediate cause in every case of lateral curvature is essentially mechanical. Structural change is produced by mechanical pressure, the equilibrium of the spinal column being disturbed, and the weight of the head and upper extremities being thrown for a length of time in the same direction, from the long continuance of certain bad positions, by certain occupations, from inequality in the length of the legs, and from certain diseases, as empyema. The predisposing causes are essentially constitutional, either hereditary or acquired; such as hereditary predisposition, the strumous diathesis, and constitutional debility.

In the consideration of the general symptoms of lateral curvature, Mr. Adams naturally takes a different view from what we generally find maintained. The enfeebled condition of the general health, together with the associated functional disturbances of the internal organs of the chest and abdomen, such as palpitation of the heart, difficult respiration, derangements of the liver, stomach, and bowels, is generally regarded as the primary and essential affection to which the spinal affection is merely secondary. Mr. Adams declares, without hesitation, that these symptoms are to be regarded as essentially dependent upon the curvature of the spine, and that the proper treatment of the deformity will, in many instances, be sufficient alone to remove them all.

Among the symptoms of lateral curvature, spinal pain, or pain referred to the region of the spine, is particularly well described by Mr. Adams. We lay before our readers a good portion of his remarks on the subject, both on account of their particular value, and as affording an example of his style.

"Spinal pain, by which I mean pain referred to the region of the spine, occurs frequently as a symptom of lateral curvature both in slight and severe cases. When it exists in slight cases, I regard it as a fortunate circumstance, because attention is at once directed to the spinal affection, and the patient placed under treatment in time for a cure to be effected; but when pain is absent, and there are no other symptoms affecting the general health, as sometimes occurs in lateral curvature, those who have much experience in the treatment of these cases, know that in such patients the spinal distortion is frequently allowed to proceed to an incurable stage before any advice is sought. With such absence of pain and other symptoms, it may also happen that the external deformity is so slight as scarcely to attract attention when the girl is dressed, even though the spinal distortion exists in a marked degree.

"*Spinal pain*, then, is by no means a constant symptom of lateral curvature, nor do I recognize any general rule as to its presence or absence in any special class of cases, or any particular form of curvature; but when it does occur, it adds very much to the distress of the patient, by producing a sensation of sickness and sometimes fainting, and often seriously affects the general health, which is sometimes still further impaired by the remedies adopted for relief. Hot brandy and water is frequently resorted to by some sufferers, whilst others habitually take opium; a second dose of opium taken for the relief of spinal pain at night, after the accustomed dose had failed to give the usual relief, was the cause of death in the case of Dr. Mantell, described in the previous lecture. These remedies are constantly resorted to by ladies without medical advice, but to a moderate extent we are obliged to sanction them when other means fail to give the necessary relief. A lengthened experience in private practice can alone make the surgeon familiar with the amount of real suffering, as wellas mental distress, entailed upon the patient in many cases of lateral curvature of the spine in its later stages; and yet in the early stages of this affection, when it is undoubtedly curable by simple means, it is generally regarded as an unimportant affection, one which the patient, by moderate care and attention to the general health, will grow out of; or at the worst, as one not likely to become of more importance than producing a little deformity, regarded as almost a natural condition when slight, and easily compensated by the dressmaker, when more severe.

"*Spinal pain* in cases of lateral curvature, may be either *diffused* or *local*, *i. e.*, it may either be diffused over the region of the spine in its entire length, or over the dorsal or lumbar region of the spine; or it may be localized to a particular spot in the neighbourhood of the spine or ribs.

"*When diffused*, the patient complains of a dull, aching pain in the back, with a sense of great weakness, worse in the erect or sitting position, and always aggravated by walking or other exercise, so that the patient abstains from all exertion; but the pain is not removed by lying down, though it is generally much diminished. In a few exceptional cases, I have known the pain to be worse in the night-time, frequently causing the patient to wake with an acute pain, for which various remedies were obliged to be resorted to. Externally, the skin over the spine is so morbidly sensitive, that the patient shrinks from the slightest pressure; even passing the finger lightly down the spine over the spinous processes gives pain. It is said by those who consider this pain to be entirely hysterical, that a firm and continuous pressure can be borne, but it has not been so in the cases in which I have tried it.

"*The cause of this diffused spinal pain* is certainly obscure. In many cases it is undoubtedly associated with hysterical symptoms, and then the hysterical explanation at once appears to be sufficient; but in at least an equal number of cases no other indications of hysteria exist, and we meet with it in patients at all ages up to fifty or sixty. It is commonly spoken of as spinal irritation, and we should certainly expect that irritation and pain at least would result from the twisted condition of the spinal column, with a corresponding alteration in the axis, or twisted condition of the spinal cord.

"In some few cases, though probably only in rare and exceptional instances, spinal pain is associated with a true inflammatory condition. A few years ago I assisted my late colleague, Mr. Lonsdale, to make the post-mortem examination of a young lady who had been some time under his care, and had suffered from diffused spinal pain which was considered to be essentially hysterical by the late Dr. Roots and other physicians, who had seen the case in consultation with Mr. Lonsdale. This opinion was held till within three or four weeks of the young lady's death, which was preceded by complete paralysis of the lower extremities, and other symptoms clearly indicating disease of the spinal cord. At the post-mortem examination we found inflammatory effusion with suppuration extending a considerable distance along the cord and membranes, with softening of the substance of the cord itself. Such cases, though rare, must lead us to be careful in our diagnosis as to the cause of pain when we meet with it in the more severe cases.

"When *local* spinal pain exists in cases of lateral curvature, it is referred to some spot in the neighbourhood of the spine, but not constantly either to the side of the convexity or the concavity of the curve; more frequently, however, the pain is referred to the side of the convexity, and when this is to the right—its most usual direction—in the dorsal region, the pain is generally referred to a part a little below the angle of the scapula: and in the lumbar region, the convexity of the curve being generally to the left, a very acute pain is frequently referred to about the position of the transverse processes. These processes being altered in their transversity by the movement of rotation previously described, project towards the skin, and push outwards the lumbar mass of muscles along the convexity of the curve, so as to form an external prominence in this situation, which, as I have already mentioned, has been repeatedly mistaken for abscess, the muscular swelling giving a doubtful sense of fluctuation.

"In many cases under my care, the acute pain at this particular spot, always increased by motion, and by the erect or sitting position, and relieved, but not removed, by lying down, has been the most distressing symptom of the spinal curvature; and, for the relief of this pain alone, advice is frequently sought in many adult cases, when the patient has no hope of any improvement being effected in the distortion of the spine."

The cause of this pain, localized in particular spots, may be satisfactorily traced in all cases to some of the local changes described as taking place in the various structures of the spine during the formation and increase of the curvature. It is to be attributed to mechanical pressure and parts not adapted to receive pressure. For its relief Mr. Adams relies upon the application of a belladonna plaster, from three to twelve inches in length, along the spine, and the use of a strong and well-adjusted spinal instrument to give mechanical support to the spine.

When on the subject of the diagnosis of lateral curvature, the main points of which may be readily understood from what has already been stated in regard to the external appearances, and the morbid anatomy of the deformity, Mr. Adams cites a very remarkable case, to which he refers repeatedly throughout the volume. It is that of Dr. Gideon Mantell, first recorded in the thirty-seventh volume of the *Medico-Chirurgical Transactions*, (1854), under this title: "Case of Distortion of the Spine, with Observations on Rotation of the Vertebræ as a complication of Lateral curvature: by Thos. Hodgkins, M. D., and Wm. Adams." In this case, although the internal curvature was very severe, there was scarcely any lateral deviation of the apices of the spinous processes, and the true nature of the affection was altogether overlooked. We mentioned above among the external appearances in lateral curvature, a swelling in the lumbar region, from the pushing out of the muscles by the transverse processes of the vertebræ, and said it gave a deceptive feeling of fluctuation. In the case now in question, such a swelling deceived all the eminent medical and surgical authorities who had been consulted in the case, and among them were Coulson, Stanley, Lawrence, Bright, Liston and Brodie. So positive were some of them that the swelling was one of lumbar abscess, that Liston offered to open it, but this happily was delayed.

The future progress in any case of spinal curvature is extremely uncertain, still there are certain general principles that are of service in founding a prognosis. A curvature in the dorsal region can be controlled more effectually by mechanical means than one existing in the lumbar region, where the transverse processes cannot receive the pressure that can be applied to the ribs. The predominance of the local or mechanical causes, the general health being good, the absence of an hereditary tendency, and the curvature not beginning at an early age, are among the chief points influencing the surgeon in giving a favourable prognosis. He will be influenced moreover by the extent to which the curvature had become developed at the time when advice is sought, by the age of the patient, by the form of the curve, and by the evidence of rotation of the bodies of the vertebræ existing in a marked degree.

In considering the treatment of lateral curvature, Mr. Adams carefully applies those views of the general pathology of this affection which he has maintained, and which we believe he has succeeded in establishing in this volume. All the cases of this deformity are arranged in three classes, according to the relative degree in which they can be traced to depend upon constitutional and local causes, and the treatment best suited to the various cases included therein, is described in detail.

In the first class, or those essentially of constitutional origin, of course the constitutional treatment is of the first importance. These cases are, generally, young children who have been insufficiently nourished. Cod-liver oil, used not only internally, but externally, by being rubbed over the whole body night and morning after a bath, is the most valuable remedy for improving the general health and strength. The preparations of iron and the hypophosphite of lime are very useful. The child must not be allowed to sit or stand for any length of time, and the back should be supported by some mechanical contrivance, as by a piece of strong leather, if the child is very young, accurately moulded to the form of the back, and properly held in position. In children rather older, as from seven to twelve years of age, a light steel spinal instrument is recommended, with one or two lateral plates, according to the form and situation of the curvature. It is entirely unnecessary for this apparatus to be worn at night; the recumbent position effectually removes the cause that leads to the curvature.

For the purpose of keeping the patient in a reclining position, which should be done at least one-third of the day, the use of a reclining chair is recommended, the inclination being about 45°. In this position, the weight of the head and upper extremities is effectually removed from the spinal column, and the patient does not suffer from headache, indigestion, and those other inconveniences that so frequently attend lying down upon the inclined plane, or lying flat upon the floor, as has often been recommended. As affording an agreeable change from the reclining chair, what is styled a *prone-couch* may be recommended. In this the body is supported in front, and certain occupations, as drawing, music, and needle-work, are thereby facilitated. We have had one of these constructed for a female patient some fourteen years of age, and it gives great satisfaction. The use of the hand-swing, the elastic chest expander, and the drawing up a weight from the ground, are the means to be used for the gymnastic exercises best suited to these cases. When the curvature is situated chiefly in the lumbar region, the use of gymnastics in the horizontal position by means of an *exercising-plane*, is very highly recommended. They possess the great advantage of strengthening the body, and improving the general health, while, at the same time, the disadvantages of the erect position are completely removed.

The second class, or cases depending upon constitutional and local causes in about equal degrees, generally occur between the ages of twelve and sixteen years. We can generally trace, in these cases, some local cause acting mechanically, so as to disturb the equilibrium of the spinal column, such as standing on one leg, sitting cross-legged, or guarding some particular position for a length of time. Besides attention to position and to certain gymnastic exercises, these cases, when confirmed, that is, when attended by the anatomical deviations already described, require the use of spinal instruments, capable of giving firm support, and also of exerting a certain amount of active force or pressure. The instruments used by Mr. Adams in these cases are of two forms: one is a modification of the Eagland spinal support; the other is a much stronger instrument of his own device. In his instrument mechanical force is exerted by lateral steel plates against the projecting ribs in the same plane, but in the opposite direction to that in which they have deviated from their normal position, in consequence of the rotation movement of the bodies of the vertebræ. The instrument should seldom be worn at night.

By this means cases of this kind, unless very considerable external deformity has occurred before they are submitted to treatment, are generally curable within one or two years.

Cases of the third class, that is, essentially depending upon local causes, acting mechanically, so as to disturb the equilibrium of the spinal column, require a treatment that is essentially local. Acquired bad habits must be discontinued; occupations tending to produce the curvature must be relinquished, &c. &c. Inequality in the length of the legs must be compensated for by raising the sole on the short leg. When these cases occur during the period of growth, the use of a spinal instrument may, in most cases, be recommended, either with the view of curing the curvature, when it arises from removable causes, or of preventing its increase when the curvature has advanced to an incurable degree, and when we cannot remove the cause by which it is produced.

These views of the morbid anatomy, pathology, and treatment of lateral curvature are more satisfactory to us than any we have elsewhere met with, and we desire strongly to call the attention of the profession in this country to them. The affection is here very frequently met with, while very few, indeed, of our medical practitioners understand ought of its true nature and of its proper treatment. What has been published upon the subject in this country will afford but little information. The "Report on Orthopedic Surgery," by Dr. David Prince, presented to the Illinois State Medical Society, at their meeting held in Bloomington, 1865, has some value, on account chiefly of historical information, and the description given of ingenious mechanical contrivances to be used in treatment. The paper on the pathology of the lateral curvature of the spine, by Dr. Charles Fayette Taylor, of New York, published in the fifteenth volume of the *Transactions of the American Medical Association* (1864), we feel it incumbent on us to refer to solely, in consequence of the respectability of the auspices under which it has been given to the public.

While we entertain the very highest opinion of the soundness and of the value of the views contained in this work of Mr. Adams, we are compelled to express regret at the manner in which he has laid them before the profession. There is a good deal of repetition, which fatigues the student, and at times, from a want chiefly of more methodical arrangement, it is difficult to seize the true sense and bearing of the expressions. The volume itself is very handsomely printed, and fully illustrated by plates and numerous admirably executed wood-cuts. W. F. A.

BIBLIOGRAPHICAL NOTICES.

Art. XVII.—*Transactions of the Medical Society of the State of Pennsylvania, at its Sixteenth Annual Session, held at Altoona,* June, 1865. 8vo. pp. 296. Philadelphia, 1865.

The opening address to the session of 1865 by the President, Dr. J. D. Ross, of Blair—comprising a series of plain practical suggestions on the proper standard of education, scientific attainments, skill, moral worth, and personal deportment for the members of the medical profession—is marked throughout by good sense.

Reports were received from the societies of twenty-two counties. Several of these reports do not furnish any account of the prevailing diseases of the respective counties, nor a single contribution to etiology, pathology, or therapeutics. Others of the reports are imperfect and unsatisfactory, while none of them are, in respect to the fulness and value of the facts and observations they comprise, what they should be, considering the amount of talent which is embodied in the medical men of the State, and the wide and fruitful field for observation with which they are presented.

From a careful collation of such of the reports before us as profess to delineate the medical history of their respective counties, we find that throughout the greater portion of the State of Pennsylvania but little serious disease prevailed during the twelve months preceding June, 1865; or to speak, perhaps, more correctly, the diseases which then occurred were of a less severe type than usual, being more amenable to treatment, and consequently productive of a comparatively less amount of mortality.

All the reports before us concur in representing the periodic fevers, formerly so prevalent in most parts of Pennsylvania, as less regular in their occurrence, the cases being everywhere less numerous, while from some localities they have entirely disappeared.

"There is no part of Alleghany," says the report from that county, "which can be denominated *koino miasmatic.* For some years very few cases of intermittent fever have originated within the county. The only locality at the present time giving origin to this type of fever is in the northeastern extremity of Pittsburg, along the alluvium near the Alleghany River, where brick ponds exist. The cases, however, are mild and easily controlled."

In the report from Blair County it is stated that intermittent and remittent fevers are less prevalent than usual, but more prone to assume the typhoid form.

In the report from Bradford County, Dr. Mason states: "We have had a little more fever than for several years past. I have discovered nothing unusual about it, excepting its persistence; nearly every case lasted over twenty days, and some continued thirty days and upwards. It was the same fever which visits us nearly every year, during the summer months, and which I call *bilious remittent fever.* It does not, however, altogether resemble that disease, as described in the books. Many cases nearly resemble typhoid fever, and as such are considered by many physicians, but the absence of diarrhœa, and of the peculiar eruption of typhoid fever, with the fact of its frequent termination in intermittent fever, satisfy me that it is a miasmatic disease."

The writer of the present notice states, in the report from Philadelphia County, as follows: "During the latter part of the summer, and throughout the entire autumn (1864), I met with a number of cases of remittent fever, all more or less of an adynamic character. Notwithstanding they ran a very protracted course, still, under the ordinary treatment, they all terminated favourably."

"In the month of August (1864) I treated a few cases of a decidedly bilious type, and with remissions scarcely perceptible. The disease, at its height, was marked by intense heat of the skin, flushed face, yellowness and injection of the eyes, violent pain of the head and back, great distress at the epigastrium, with pain upon pressure; always nausea, often vomiting; costive bowels, a red tongue, pointed at the extremity, and coated, along its centre, with a thick, yellowish paste; a frequent, quick, and sometimes full pulse; delirium, especially towards evening and during the night. In one or more of the cases, seen by me, bleeding from the arm was resorted to with the best effect; in all, cups or leeches to the temples or nape of the neck, and leeches to the epigastrium were found decidedly beneficial. To unload the bowels of their tar-like contents calomel, or blue mass, with aloes, gamboge, or soap, or the compound extract of colocynth, was found to be among the best agents, and to be retained upon the stomach with far greater ease than any of the apparently milder cathartics. In one case, accompanied with great pain of the head, throbbing of the temples, acute delirium, and almost continued nausea, after many attempts to procure a discharge from the bowels, a number of leeches were applied to the forehead, temples, and behind the ears, almost immediately afterwards the bowels were, spontaneouly, freely evacuated, and it was not long before convalescence ensued. After the remissions were rendered distinct and free, healthy evacuations from the bowels were procured; in all the cases of fever just referred to convalescence was always rendered more rapid, and more quickly confirmed, by placing the patient at once upon the use of quinia.

"In the vicinity of Philadelphia *intermittent fever* is by no means so common a disease as it was in former years, while, in the heart of the city, it is never met with except in those who have contracted it elsewhere. It is no uncommon thing for a citizen who has visited a malarial district to return to his home apparently in better health than when he departed, but, after the lapse of a short time, to be attacked with fever and ague, which will be suspended by the use of quinia to recur subsequently, say in the following spring or autumn, with increased violence. In some instances paroxysms of chills and fever have, in such instances, recurred not merely once but repeatedly, after intervals of five and six months."

Since the foregoing was written many cases of intermittent fever have occurred within the very heart of the city of Philadelphia, and in persons, seemingly, who had not been exposed, either at home or abroad, to any malarial influence—certainly to none which could be detected.

While periodical fevers are fast disappearing from our State an increase of fever of a continued type, especially of the typhoid or enteric form, is noticed in all the reports before us. In that from Alleghany County, "typhoid fever," it is remarked, "has become epidemic in most parts of the county. It first made its appearance, and prevailed as a wide-spread and severe epidemic, about the year 1847, or, at least, it then became first recognized. Every year since it has occurred in some portion of the county during the latter part of summer, but especially during the fall months, and sometimes, also, during those of spring. In 1864 it made its appearance about the middle of August, and continued to prevail, with more or less violence, until the last of December. It was mild in character, and had a tendency to assume the remittent type. In the city of Pittsburg the ratio of mortality from typhoid fever of the whole number of deaths was one twenty-fifth.

In the county just named, it is stated that "An asthenic element, a vitiated tendency, and want of integrity in the circulating fluids of the body, have been noticed in nearly every class of disease. However inflammatory and high the grade of action at the invasion, this condition usually passed off, and was replaced by a typhoid disposition and increased prostration, requiring an early resort to a stimulant and tonic course of treatment."

In Blair County we are told that remittent fever was extremely prevalent. In about fifty per cent. of the cases, however, there was an evident blending of the remittent and typhoid types of fever. They ran a course of several weeks, followed by a long and tedious convalescence. Some of the cases were complicated with either epistaxis, hemorrhage from the bowels, or diarrhœa. These discharges, at times, proved critical, convalescence following soon after their occurrence.

In Huntingdon County, during the winter and early spring, all diseases are reported to have assumed more or less of a typhoid form, and, almost from their onset, to have required a stimulant and tonic treatment.

The boom, situated on the west branch of the Susquehanna River, collects within it a vast quantity of organic matter, which is subjected to the intense heat of the sun during the summer months. The malaria thus produced has a marked influence upon the progress, duration, and termination of the diseases occurring in the immediate vicinity. Few families, we are told, escape an attack of intermittent or remittent fever. The latter being prone to assume the true typhoid character, with *tache rouge*, diarrhœa, etc. In all such cases the exhibition of quinia early in the day, in the first stage of the disease, was found to render the attack mild and lead to a speedy convalescence.

Spotted fever is not mentioned in several of the reports. The inference is that it did not prevail to any extent, excepting in a few sections of the State, during the twelve months preceding June, 1865.

In the report from Lehigh County we are told that a few cases of the disease were met with, mostly in persons under adult age, and all of a very malignant type. Retraction of the head set in early.

Dr. Evans, in the report from Montgomery County, relates two cases of spotted fever, all that he had met with. The family in which they occurred was, he states, particularly cleanly, and comfortable in all respects. Their dwelling was located in a valley through which runs a large stream of water. The disease, Dr. Evans adds, he has found to be always more prevalent along water courses; much the larger proportion of cases in his county having occurred about the shores of the Schuylkill and Delaware Rivers.

In Northampton County spotted fever appeared early in February, 1865. As in its preceding occurrences the disease extended for about two miles along both shores of the Lehigh River; never showing itself far from the river, excepting in a single case.

Dr. Green tried the effects of sulphite of soda in one case of the disease with favourable results. Pains were allayed, and the rigidity of the cervical muscles relaxed soon after the remedy was taken.

In the report from Philadelphia County the following remarks, in reference to spotted fever, are made by the author of the present notice:—

"Throughout the year I have met with cases of the so-called spotted fever. It was confined to no age, though more frequent, unquestionably, in young subjects than in those of middle age or beyond. The greater number of the cases were in males, yet the proportion of cases was not very decidedly in favour of one more than of the other sex. In regard to locations, my patients all resided in such as were of a comparatively healthy condition, and in dwellings by no means particularly objectionable in a sanitary point of view. Taking into view the entire history of the disease, as it has appeared in our midst, I think it will be found that it is most prevalent in low, damp situations, or in the immediate vicinity of sluggish streams, and in the autumn, winter, and spring months.

"The cases which came under my notice since June, 1864, were mainly of the tetanic form, there being present more or less decided opisthotonos, hyperæsthesia, with some degree of delirium, followed in many cases by coma, not generally, however, of a very intense kind. In three cases the disease assumed the algid form, and in ten it was attended with prominent symptoms of bronchial inflammation. These last thirteen cases all occurred during the interval between the months of November and March. The tetanic cases yielded very readily to treatment, quinine and opium internally, and blisters, dry cups, or vesicants along the course of the spine, but especially in the cervical region. Many of the cases required an early resort to alcoholic stimulants. The greatest care, however, is to be observed in the use of the latter. Given in the right cases, at the right period, and to the right extent, they invariably do good; but when mismanaged their influence is decidedly mischievous. It is only by experience, and watching carefully their effects when administered, that skill in their proper management can be acquired. In most, if not in all, cases I have seen the best results ensue from the use of an infusion of half an ounce each of cimicifuga, serpentaria, and valerian, with one ounce each of the bark of the prunus Virginiana and sassafras, in a quart of boiling water, given in the dose of a wineglassful every three hours. Of the proper treatment of the algid form of spotted fever I can say but little. Of the only three cases I have met with, all of which occurred during the autumn and winter of 1864, I lost two. The remedies employed were the warm bath, sinapisms, and rubefacients externally, alcoholic and other diffusible stimulants, with quinia, internally. Under this treatment prompt reaction took place, and a very speedy recovery ensued in one case; in the others it appeared to produce no effect whatever. In the cases attended with bronchial disease a well-directed tonic and stimulant treatment was demanded in every case, with opiates, in well regulated doses, to allay irritation and cough, cups, either scarified or dry, to the posterior of the thorax, between the scapulæ, a blister to the chest anteriorly, followed by a soft emollient poultice, repeated three times a day, and continued thus for several days, were very generally of decided advantage. During convalescence the greatest care was requisite in order to prevent a relapse of the pulmonary disease from exposure to cold and damp, too thin clothing, etc."

The occurrence of scarlet fever is noticed in the reports from Blair, Huntingdon, Lycoming, and Philadelphia counties. Its prevalence appears, however, to have been very restricted. The disease, also, was of a comparatively mild type, and was attended by only a slight amount of mortality.

In nearly all of the counties from which reports were received, measles prevailed to a greater or less extent, and produced in many a large number of deaths, not from the disease itself, properly speaking, but from concomitant and consecutive bronchitis and pneumonia; diarrhœa was also a frequent accompaniment of the measles in some portions of the State.

From the contribution furnished by us to the report from the Philadelphia County Medical Society, we quote the following remarks:—

"In common with the scarlet fever and measles, and in the same localities in which these diseases most prevailed, numerous cases of *roseola* were observed. This exanthem, which has been studied with some care by several of the Continental physicians, especially those of Germany, is deserving of more attention than it has heretofore received on the part of the physicians of this country. Not that it is a disease of any great importance in itself, being unattended with any suffering, very generally disappearing spontaneously, when left without any indiscreet interference, and seldom, if ever, entailing any danger on the person in whom it appears. Its only interest results from the fact that it may be, and indeed often has been, confounded with either scarlet fever or measles; one or other of which exanthemata it so closely resembles, in different cases, or at different stages of the same case, as to render it difficult to distinguish it from them as a distinct and somewhat anomalous disease.

"While, as we have remarked, roseola in some cases simulates measles, and in others scarlatina, cases of it also not unfrequently occur in which it presents an eruption like measles on one day, and on the next, perhaps, one similar to that of scarlatina. Roseola seldom lasts beyond the second or third day; in some instances it disappears in from twelve to eighteen or twenty-four hours. It is very liable to sudden and even repeated relapses.

"It is said that, by the rash alone it is often impossible to distinguish one of the forms of roseola from a mild attack of measles, and another of them from the simplest form of scarlet fever. From the more severe forms of these diseases this can be much more readily done—if not by the difference in the eruption, by the concomitant symptoms, the sore throat, intensely hot and dry skin, and frequent pulse, and other decided constitutional disturbances in scarlatina; the coryza, injected and watery eye, fever, and other well-marked catarrhal symptoms, in measles.

"There is no reason for believing roseola to be contagious, though it will often make its appearance at nearly one and the same time, in several members of the same family, subjected alike to the same external conditions. It does, unquestionably, often prevail epidemically, and very generally precedes or accompanies epidemics of scarlatina and of measles. Its exciting cause may be, perhaps, connected in numerous instances with certain local domestic conditions, errors of diet, or peculiar articles or forms of food or of clothing.

"The treatment required in cases of roseola is very simple; it should in every case be regulated by the character of the symptoms present."

Diphtheria, judging from the reports before us, has continued to prevail, more or less extensively, throughout the State. Exhibiting in some sections considerable malignancy, while in others, it was of a mild character, and readily controlled by an appropriate treatment. We find nothing in these reports calculated to throw any new light upon the esteology, pathology, or management of the disease. Nearly all who speak of their experience in its treatment depreciate the local application to the fauces of caustic or irritating substances. Strong testimony is borne to the good effects of ice applied to the throat, and held in the mouth, as recommended by Dr. H. Corson, of Montgomery County.

During the larger portion of the autumn and winter of 1864–65, and the spring of 1865, catarrhal affections, and inflammatory diseases, generally of the respiratory organs, appear to have prevailed throughout every portion of the State; in some portions of it to a much greater extent than usual. In most instances the cases were of an acute and sthenic character, and demanded the use of the lancet, cups, antimony, calomel, nitre, blisters, and the usual antiphlogistic treatment generally. In other localities, however, the cases exhibited a decidedly typhoid character, precluding the use of all direct depletion, and calling for an early resort to tonics and even stimulants.

The prevalence of the various forms of intestinal disease is noticed in nearly all the reports embraced in the present volume of *Transactions*. Diarrhœa, dysentery, cholera morbus, infantile cholera, etc., seem to have held a very prominent place among the diseases met with by the physicians with whose statements we are furnished, especially those in the interior of the State.

Erysipelas is noticed in several of the reports as having occurred in certain localities. In some sporadically—though to a much greater extent than usual—in others, epidemically, and of a very severe character. In the report from Philadelphia County, we present the following remarks in regard to the cases of erysipelas observed by us:—

"The disease I believe to be a true eruptive fever, the affection of the skin being as much dependent upon some morbid condition of the blood, or of the general system, as is the affection of the skin in scarlet fever, measles, or variola. In the cases seen by me, the erysipelas was of the true ambulant character, gradually spreading to the surrounding surface, usually in one direction, as it disappeared at the part it already occupied, and, in this manner, travelling over the entire face and scalp, as well as the greater portion of the upper half of the body. The colour was of a dusky red; large vesications early formed, filled with a very thin serum, sometimes of a yellowish colour, occasionally tinged with dark-coloured blood. The local swelling and sense of heat or burning were generally very considerable. The attendant fever was of a decidedly typhoid character. The fauces, in several of the cases, was dark red and dry, and the tongue very dark-coloured, dry, and shrivelled, rendering speech and deglutition difficult. In most of the cases, violent delirium set in early, and was followed often by low muttering delirium or coma. In none was the erysipelatous condition of the skin the result of any external injury. The disease was, in general, protracted in its course. The patients in whom it occurred were six of them females, and five males. Most of them were of feeble or broken-down constitutions. The oldest was sixty-five, and the youngest twenty-two years of age. There was nothing particularly objectionable, in a sanitary point of view, in respect to the location or condition of their dwellings. Of the eleven patients treated by me, nine recovered, and two, both males, died. The remedies I chiefly relied upon were the tincture of the muriate of iron, quinia, with, in nearly every case, diffusible stimulants and opiates. The only external application I made use of was lard, applied in sufficient quantity to keep the diseased surface from contact with the air. Blisters seemed to me to do more harm than good; painting with tincture of iodine failed to prevent, in every instance in which it was tried, the spread of the erysipelatous inflammation."

In many parts of the State smallpox prevailed extensively. It was not, however, so widely spread, generally speaking, or of so malignant a type, as was the case a few years since. Vaccination has been more universally and carefully performed of late years, and the importance of revaccination more fully recognized by the community at large. In several of the reports under notice, a series of facts, the most pointed and irresistible, are presented of the efficacy of vaccination, as a prophylactic of smallpox, provided it be repeated on the near approach of or actual outbreak in any given vicinity of the latter disease.

Following the reports from county societies, are three papers; two of them voluntary contributions from physicians of other States, and the other prepared in obedience to a special appointment by Dr. John Bell, of Philadelphia.

The first of these papers is the history of inoculation in Pennsylvania, by J. M. Toner, M. D., of Washington, D. C.

The paper is one of very great interest, not only because of its professed theme, and the faithfulness with which it is discussed, but on account, also, of the sketches, which are appended by way of notes, of the leading physicians of the early days of Philadelphia, from 1682 to 1791, and of the humble beginnings of the first American college—"now an honoured and formidable rival of the most celebrated of the medical universities of Europe."

The second paper is "On the Uses of Opium in Shock, Reaction, and Inflammations," by Edmund F. S. Arnold, M. D., of Yonkers, N. Y. The views laid down by the author are suggestive of important practical results, and in this light it is to be considered an important contribution to therapeutics. The following are the general conclusions at which the author has arrived:—

"1st. Opium is a highly compound drug, containing directly stimulating as well as sedative principles; the former are not less powerful nor less important to us than the latter in availing ourselves of its therapeutic action as a whole; to class it simply as a narcotic is to confuse our ideas of its true remedial actions, and frequently to cause it to be injuriously applied.

"2d. Owing to its stimulant tendencies, the prostrated and exsanguine conditions of the system are favourable, and, indeed, are necessary to full tolerance of the drug, which may then be beneficially exhibited in proportion to the extent to which they lower the vital powers.

"3d. When by the shock of a severe injury, especially if accompanied by excessive hemorrhage, the powers of life are reduced to the lowest ebb, the patient may frequently be rallied, when all other remedies are of no avail, by the stimulating and reviving powers of opium, administered at short intervals in moderately full doses of from two to three grains, or of laudanum in drachm doses or more.

"4th. In proportion as the vital powers are less reduced, the administration of opium during the shock becomes unnecessary, and will be fraught with more danger, and that it will be proper, therefore, to rely in part or wholly on other measures in ordinary use, such as warmth, friction, diffusible stimuli, &c., according to the circumstances of the case.

"5th. When reaction is indicated by returning sensation and pain, opium is an invaluable agent for controlling it, and preventing its excess, regard being had to the conditions under which a tolerance of it is established.

"6th. When, by general prostration induced by the severity of the injury, or by previous hemorrhage, or by venesection, tolerance of opium has been established, the allaying of pain may serve as a guide as to the extent to which it shall be given, and that it may then be safely carried to any extent necessary to accomplish that result, inasmuch as by its effect on the sensitive nervous system we are able to estimate and gauge its effects on the organic, and that further, the system should be kept under its influence until the reactionary dangers are past, readministering it as often as the recurrence of severe pain renders it necessary.

"7th. By its powers of rallying and supporting the nervous energy, allaying irritation, freeing and equalizing the circulation and keeping it within bounds, the system is placed in the best possible state for the healthy exertion of the reparative process or *vis medicatrix naturæ.*

"8th. As soon as this has been established in a healthy manner, the opiate may be gradually withdrawn, and the case treated on general and established principles, according to the phases it may assume.

"9th. In proportion as reaction has advanced, and inflammation and constitutional irritation have set in, the free use of opium will be contraindicated, unless the inflammation be previously removed by bleeding."

The same views here set forth may be strictly applied, Dr. A. remarks, to the action of opium in ordinary inflammations.

The closing paper, by Dr. Bell, of Philadelphia, is "On Physical education." It is marked by learning and ability. The principles it inculcates are sound, and its teachings throughout practical and calculated to benefit health, promote vigour, and augment the feeling of comfort in those by whom they are carried out in all their details. We regret that the circulation of so able a paper on a subject of such general interest should be confined within the narrow limits beyond which it cannot be expected that the present volume of *Transactions* will extend. D. F. C.

Art. XVIII.—*Reports of American Hospitals for the Insane:—*

1. *Of the Indiana State Hospital, for the fiscal year* 1863–64.
2. *Of the Illinois State Hospital, for the fiscal years* 1862–63, *and* 1863–64.
3. *Of the Eastern (Kentucky) Asylum, for the fiscal year* 1863–64.
4. *Of the Longview Asylum, for the fiscal year* 1863–64.
5. *Of the Southern (Ohio) Asylum, for the fiscal year* 1863–64.
6. *Of the Central (Ohio) Asylum, for the fiscal year* 1863–64.
7. *Of the Friends' Asylum, for the fiscal year* 1864–65.

1. As, in former notices, we have given the State of Indiana all due credit—and that is much—for the munificent beneficence with which, when her *Hospital for the Insane* was founded, she assumed the burden of its total expenses, it is now necessary that, in justice to historical truth, we should record the fact that, more than once, she has, by legislative *inaction*, entirely overlooked the annual pecuniary claim of that institution, and permitted it to struggle on, as best it might, without an appropriation. Such was the fact for the fiscal year 1863–64, the report of which is before us; and relief from the embarrassments arising from the omission was only obtained through "the considerate care and irrepressible energy" of the Hon. O. P. Morton, Governor of the State.

	Men.	Women.	Total.
Patients in hospital, Oct. 31, 1863	147	148	295
Admitted in course of the year	93	101	194
Whole number	240	249	489
Discharged, including deaths	100	105	205
Remaining, Oct. 31, 1864	140	144	288
Of the discharged, there were cured	54	52	106
Died	10	5	15

Died with exhaustion of chronic mania, 4; exhaustion of acute mania, 4; consumption, 4; pneumonia, 2; apoplexy, 1.

A large part of this report is devoted to "Another Appeal for more Room." It appears that the building, as originally designed, has never been completed. One wing, intended for about one hundred patients, has not been erected; and it is for the construction of this that the appeal is made.

2. The reports of the Illinois *State Hospital for the Insane* are biennial; and the one now before us embraces the two official years, 1862–63, and 1863-64.

Patients in hospital, Dec. 1st, 1862	302
Admittted in course of two years	408
Whole number	710
Discharged, including deaths	409
Remaining, Dec. 1st, 1864	301
Of the discharged, there were cured	159
Died	42

Died of typhoid dysentery, 14; exhaustion from acute mania, 6; exhaustion from chronic mania, 3; epilepsy, 3; consumption, 2; smallpox, 2; suicide 2; softening of the brain. 2; paralysis, chronic diarrhœa, typhoid fever, pneumonia, abscess, carbuncle, hæmatemesis, and cancer, 1 each.

A large part of Dr. McFarland's report is occupied by a discussion of the subject of "the condition of the insane in their relation to institutions" in which a peculiar, but very annoying form of mental disorder is thus accurately described:—

"In these cases, the subtle unhinging of some radical constituent of the mental being, whose agency in the natural working of the machine is beyond our philosophy, produces a form of disease at once unique, perplexing, and in the highest degree difficult to treat with satisfaction. The small apparent evidence of a departure from mental soundness, especially at only a brief observation, adds to the embarrassments attending the case, as the individual is ever ready to play upon the doubts of any who may question the fact of insanity.

"There is usually just brain excitement enough to give increased force and acuteness to every operation of thought, and those unaccustomed to mental admeasurements may be struck only by what appears to them extraordinary brilliancy of idea and originality of expression. It is singular, but I believe true, that such persons may utter almost any continuation of spoken language without betraying themselves—the severer ordeal of writing, alone, serving to discover the diseased mental processes. What will add still more to the accumulated difficulties of the case, is, that the individual, quite frequently, understands precisely what will be considered proofs of insanity, and dextrously avoids actual commitment on subjects where the close student of the case can yet discover that there are diseased conceptions. The listener will sometimes be carried quite to the verge of some actually diseased point, and there be left, to reach it by the irresistible force of an inference.

"If all the difficulties attending such cases consisted in anomalies of thought only, few of them would become objects of hospital treatment, and thus would have no mention in this connection. But from this peculiar root of the matter, whatever it may be, there springs conjointly, a set of moral perversities which have the effect to throw the individual into cross purposes with others, of the most trying character. To thwart, disorganize, and destroy the salutary influences and purposes of others, who are moving along in the ordinary pathway of human affairs, is a mission upon which they are driven with all the impelling power of insanity—a force infinitely stronger than the incentives which proceed from reason and natural sense of duty.

"It is fortunate for others if some imaginary call breaks up the local attachments of such persons, and sends them abroad, as is frequently the case, as peripatetic reformers. A vagrant life has the effect to diffuse and dissipate, as it were, any intensities of feeling, and they eventually sink out of sight by the supervention of a mild but quite palpable insanity. Pent up within the limits of a family, a church, or a circumscribed community, the evil influence of such a person will eventually reach an explosive point, under which the prayers of their friends for their admission to the hospital become too pressing to be resisted. Those familiar with the history of the commotions of the infant colony of Massachusetts Bay, in connection with the doings of Anna Hutchinson, will find, in an investigation of the disease, the key to the singular career and hapless fate of that once famous personage.

"Happily these cases are few in the records of our institutions, as one instance will cause more annoyance than scores of ordinary cases. Of the propriety of their admission there will be many opinions—one class, only, being unanimous—those who have most to do with them and can best compare them with their former selves. In a hospital, their power of mischief is intensified by the limited area of their operations. To fill the minds of less intelligent patients—especially new comers—with prejudices and terrors, in the face of which no improvement is possible; to instil suspicions into the minds of friends of other patients by surreptitious correspondence; to set nurses at variance by artful misrepresentations; and to harangue visitors upon imaginary abuses suffered, are among the ordinary devices of these anomalous subjects. The wondrous adroitness with which they will place themselves in positions where they can have some pretext for considering themselves as subjects of abuse; and their ceaseless clamor when their pet grievances have a colour of support, tax to the utmost the vigilance and patience of those assigned to the care of them. Most welcome is the day which brings the order for their discharge."

Of the cases of this kind which have come to our knowledge, there is one of which the foregoing description is so "like" that it would seem that the man must have specially sat for the picture. Being "pent within the limits of a church," his disease reached the "explosive point," at which he was placed in a hospital where his career was conformable to the above account. Discharged moderated but not cured, he was imaginarily called "abroad. as a peripatetic reformer;" but we have good reason to know that those among whom he went did not consider the mission as particularly "fortunate" for themselves. In his case there was no supervention of a milder form of insanity, and no "sinking out of sight" until he sank into his grave.

3. The report of the Superintendent of the *Eastern Lunatic Asylum*, Kentucky, for the fiscal year terminating Sept. 30th, 1864, opens with a brief history of that institution, from the time of its origin; but as this subject has heretofore been sufficiently laid before our readers, it is unnecessary that we should give it farther attention.

	Men.	Women.	Total.
Patients in hospital Oct. 1, 1863	133	98	231
Admitted in course of the year	26	19	45
Whole number	159	117	276
Discharged, including deaths	18	17	35
Remaining, Oct. 1st, 1864	141	100	241
Of the discharged there were cured	6	7	13
Died	10	8	18

Deaths, from phthisis pulmonalis, 2; exhaustion, 3; *paralysie générale*, 2; epilepsy, scrofula, paralysis, and dysentery, 1 each.

"Consumption continues to be the predominant, immediate cause of death. The phenomena presented by this malady, as it affects the insane, differ materially from those occurring in cases in the ordinary walks of life. There is far less suffering, little or no cough, and, in many cases, no notable expectoration until a few days before the final termination. Yet in some cases of this description we have found an almost total destruction of the pulmonary organs. Besides the physical signs, progressive emaciation is the chief symptom."

When writing in regard to the whole number of deaths during the forty years of the existence of the hospital, Dr. Chipley has made the following valuable contribution to hygienic knowledge:—

"It will be observed that death is attributed to diarrhœa in fifty cases. All of these occurred between 1844 and 1856. No note is made of the causes of death prior to 1844, and we cannot say how many may have perished of diarrhœa during the first twenty years. We know that, prior to 1856, diarrhœa prevailed in the institution at all seasons, and more or less of the inmates were its subjects at all times. I was convinced that this was owing to the water used in the institution, rendered impure by our drainage. Under the authority of the Board of Managers, after persistent solicitations to that end, an artesian well was bored to the depth of one hundred and six feet, and an abundant supply of water procured. At the time, there were about forty cases of diarrhœa in the hospital. After ten days not a case remained—no serious case has occurred since, and not a single death, from this cause, has happened since the source of water supply was changed in the spring of 1856. The annual average mortality during the past nine years was 6.00 per cent. The preceding nine years gave an average annual mortality of 13.21 per cent.; an excessive mortality, due in a great measure, I think, to the impurity of the water consumed in the institution during that period."

While acknowledging that the civil war "does not seem to have materially increased the number of the insane," the doctor, like several of his fellow-superintendents, expects an augmentation after the contest shall have ceased. "Habits of life," says he, "are everywhere changed. Thousands, who have lived in comfort, many, who were born and nurtured in affluence, are now engaged in a desperate struggle to supply the commonest wants of life; other thousands have been lifted from the vale to the heights of fortune, and are already running a course of dissipation and improvident extravagance, quite in contrast with the virtuous, quiet, humble life of the past. It is lamentably true, that morals have not escaped unscathed. We are becoming so inured to bloodshed, that the value of human life has fearfully depreciated. A thousand frivolous excuses are sought to cover the cruel acts of brigands, and the infamous practices of unscrupulous robbers. The whole moral atmosphere has become tainted. The last four years have indeed wrought wonderful changes, physically, mentally, and morally, and no such sudden and violent changes of habits, of modes of thought, and of processes of reasoning, can fail to yield, in the future, a profuse crop of bitter fruits."

This report contains much interesting matter which, by reason of our restricted space, we are obliged to disregard; and we close this notice of it with an extract from that portion which treats of the employment of patients.

"No serious accident has occurred with us, nor has any violence been done with the tools or implements placed in the hands of patients. During ten years I have hesitated in only one instance to place suitable tools in the hands of persons willing and capable of performing labour. The peculiar nature of this person's delusions, and the suddenness with which they seemed to exert their motive power, rendered it improper to indulge him in the use of the tools he had been accustomed to handle.

"A large number are employed every day, and these are reinforced on occasions by many more. We have had as many as sixty men in harvest field at one time; yet, joined in their labours by three or four careful attendants, they cheerfully worked together in great harmony. A heartier meal, eaten with a higher zest, and a sounder slumber at night, reward the labourers."

4. In the report of the *Longview Asylum*, Hamilton Co., Ohio, for the fiscal year 1863-64, Dr. Langdon thus writes of the liberal basis upon which that institution is founded:—

"It is a fact which may justly excite the pride of every citizen of Hamilton County, that there is no place, either in this country or Europe, which surpasses this county in its ample provision for all classes of insane; where all are received and cared for at the public expense, until they are restored to reason or released by death. * * * * All the insane, rich and poor, curable and incurable, are amply and comfortably provided for. * * * * Indeed, but few, and these the wealthiest of our citizens, can command the means of recreation, amusement, care and attendance provided in the Institution, at no cost to those who are residents of the county."

	Men.	Women.	Total.
Patients in Hospital, Oct. 31st, 1863	179	177	356
Admitted in course of the year	60	81	141
Whole number	239	258	497
Discharged, including deaths	64	66	130
Remaining, Oct. 31st. 1864	175	192	367
Of the discharged, there were cured	35	45	80
Died	12	14	26

Died from phthisis pulmonalis, 10; epilepsy, 4; typhoid pneumonia, 3; general paralysis, 2; typhoid fever, puerperal fever, marasmus, inflammation of bowels, maniacal exhaustion, inflammation of bladder, and hepatitis, 1 each.

"One of the most disagreeable duties of the Superintendent," says the report, "consists in resisting the importunities of patients and their friends to allow frequent visiting. As a general rule, I allow no visits for the first two weeks after admission, and after that I am governed by the condition of the patient. When convinced that visits are positively injurious I peremptorily refuse admittance to every one, notwithstanding the fact that it generally gives great offence to friends and relatives, who are apt to attribute my conduct to an unaccommodating spirit and a desire to display my authority."

Of the whole number of patients admitted since the outbreak of the rebellion, the insanity of thirty-two is attributed to "war excitement," and Dr. L. asserts his belief that most of these "had another origin." He fears, however, that after the return of peace there will be psychic revulsion more prolific of mental disorders.

5. The general statistics of the *Southern Ohio Lunatic Asylum*, for the year ending with the 31st of October, 1864, are as follows:—

	Men.	Women.	Total.
Patients at the beginning of the year	76	87	163
Admitted in course of the year	38	45	83
Whole number	114	132	246
Discharged, including deaths	42	42	84
Remaining at the end of the year	72	90	162
Of the discharged, there were cured	28	25	53
Died	8	6	14

Died with mania, 4; apoplexy, 3; consumption, 3; paralysis, 2; disease of heart, and gangrene of lung, 1 each.

In commenting upon the results of all the cases treated in the hospital from the time it was opened, Dr. Gundry says:—

"It will also be observed that the proportion of deaths of the males is much larger than that of deaths of females. So that, judging from the experience of this hospital for nearly ten years past, more males recover or die than females, and, therefore, that at the end of a given period, in the history of an equal number of both sexes of insane, there will remain a greater proportion of insane women than of insane men. And this will explain to some extent how it usually happens that in a census of the insane population of a country, the number of insane women exceeds that of insane men, and this, also, notwithstanding that a careful analysis of all cases occurring in the same region would show that more men than women actually become insane."

The report contains a brief narrative of one of those tragical events which occasionally mar the annals of the hospitals for the insane. We copy it nearly in full.

"On the 27th of July last, John Runk, an attendant, was killed under the following circumstances: He was assisting the patients at their supper, and was in the act of pouring out the tea, when a patient seized a carving knife lying on an adjoining table, and instantly stabbed him in the chest and abdomen, before assistance could be rendered by the other attendant and patients present. The first wound, which proved fatal, penetrated the chest, cutting through two ribs, and inflicting a deep wound in the substance of the liver. Death occurred after a few hours of suffering. * * * * The tragedy was the result of a purely homicidal impulse, without any special delusion associated with the unfortunate victim. The patient has been in the Institution more than nine years, and had made several sudden and violent attacks upon some of the officers and attendants. In none of these attacks was there any premonition or warning, and immediately after them he subsided into his usually quiet and docile demeanour. * * * * In this connection, I cannot omit to mention the promptness shown by some of the patients present, at great risk to themselves, in seizing the offender and taking the knife from his hand."

6. In the report of the *Central Ohio Lunatic Asylum*, for the fiscal year ending with the 31st of October, 1864, we are informed that Dr. R. Hills, who for more than eight years had filled the office of Superintendent, had resigned the place, having been appointed to the superintendence of the new hospital for the insane in West Virginia. His resignation was to take effect on the 8th of November, and his successor, Dr. W. L. Peck, was to begin his duties on the 1st of January, 1865, the place being filled, in the interim, by Dr. Wm. H. Morrell, First Assistant Physician.

	Men.	Women.	Total
Patients in hospital, Nov. 1st, 1863	126	126	252
Admitted in course of the year	74	89	163
Whole number	200	215	415
Discharged, including deaths	76	74	150
Remaining Oct. 31st, 1864	124	141	265
Of the discharged there were cured	46	47	93
Died	9	3	12

In discussing the question of the effects of the war in the production of insanity, Dr. Hills, for the purpose of practical illustration, introduces a table showing the number of patients admitted into the hospital, from forty-two counties in Ohio, in the course of the preceding seven years—three and a half years of war, and three and a half years of the preceding peace. The number in the term of peace exceeds that of the term of war by 115, or 18.31 per cent.

He then proceeds: “The cases of insanity occurring have not been kept out of the asylum more than usual, in this State; but, on the contrary, if any difference, they have been more promptly brought than heretofore, the asylums being free and with open doors, while in many instances there is less ability to take care of the cases at home.” He attributes the diminution to the wholesome influence of the diversion of the popular mind into new channels of thought, and the popular activity into new and important spheres of labour. “This diversity of employment and more constant exercise, give greater vigour and tone to the mind, and enable it better to bear the shocks of grief, and the wear and tear of anxious cares and responsibilities. The great law of mental and corporeal health is ACTION—energetic and diversified employment of mind and of body. Hence, strange as it may sound, this war by its various compulsions, is incidentally reducing insanity in the land, imparting wide-spread practical information, and giving to our younger population increased mental tone and vigour, that may tell even upon future generations.”

7. “During the past year,” writes Dr. Worthington, in his report of the *Friends' Asylum*, for the fiscal year 1864–65, “the average number of patients has been greater than in any previous year in the history of the institution. Owing, however, to the small number of recent cases under treatment, the number of patients restored has not been so large as in some previous years.”

	Men.	Women.	Total.
Patients in hospital, March 1st, 1864			63
Admitted in course of the year			25
Whole number	36	52	88
Discharged, including deaths	6	16	22
Remaining March 1st, 1865	30	36	66
Of the discharged, there were cured	1	6	7
Died	2	6	8

Died with pulmonary consumption, 2; acute bronchitis, congestion of brain, epilepsy, enteritis, and injuries from a fall, 1 each.

This report corresponds very nearly with our idea of what an essay of the kind should be, inasmuch as it conveys to the reader a sufficiently definite understanding of the plan and the facilities for treatment, and to a certain extent portrays the benefit of that treatment. Reports of this kind afford less material than some others for the medical reviewer, but, at the same time, are best adapted to the wants of the people.

We do not remember to have seen the great aims in treatment more cleverly stated than in the following extract:—

“To assimilate, as nearly as practicable, the condition of the insane to that of persons in sound health of body and mind, and, in cases which cannot be restored, to employ their remaining faculties in the most rational way possible, are among the principal objects of asylum treatment. To imbue them with feelings of self-respect, in the exercise of which they may be stimulated to make use of their energies for their own and others' benefit, is one of the most important points to be kept in view in the moral treatment of the insane. Nothing is better calculated to promote these ends than occupation in some useful employment which shall afford that amount of bodily exercise which is essential to the maintenance of the physical health, and at the same time give them the grateful consciousness that they are still capable of doing something useful."

"It would show a radical defect in the great system of hospital treatment of the insane, if it failed to make those who are its objects comfortable and contented with their lot; and no better proof could be furnished of its adaptation to the wants of the insane, than to see the inmates of such institutions satisfied with their condition, and preferring it even to remaining with their friends. That this is the case with a great majority of those who are thus provided for, I believe will be proved by the experience of all well conducted institutions of the kind. With the exception of a small number of patients, whose disease is manifested chiefly by an unhappy and discontented spirit which can be satisfied nowhere, the general feeling among the inmates of the asylum has been that of contentment and satisfaction. Those who have themselves experienced the benefits of hospital treatment can best appreciate them, and instances are by no means rare of patients who have been under the care of the asylum coming voluntarily to seek its assistance in a second attack."

It is believed that these voluntary returns are becoming frequent at most, if not all of our hospitals; and *voluntary first admissions* are not rare at some of them. P. E.

Art. XIX.—*The Practice of Medicine and Surgery applied to the Diseases and Accidents incident to Women.* By Wm. H. Byford, A.M., M.D., author of a "Treatise on the Chronic Inflammation and Displacements of the Unimpregnated Uterus," and Professor of Obstetrics and Diseases of Women and Children in the Chicago Medical College. 8vo. pp. 556. Lindsay & Blakiston, Philadelphia, 1865.

Were we to estimate the advance made in our knowledge of the pathology and therapeutics of the diseases and accidents peculiar to the human female, by the number of monographs and treatises devoted to their consideration, which have appeared within the few past years, we might reasonably infer, that the profession possessed a very intimate acquaintance with those diseases and accidents—their nature, seat, and causation, and with the means best adapted to allay the more painful and threatening of their symptoms, and to conduct most of them to a favourable termination.

That the maladies of women have been of late years studied to a greater extent and with more care than previously, and that, in consequence, our acquaintance with their pathology is more intimate and accurate, and our therapeutical management of them more rational and successful, is unquestionably true. It is, nevertheless, equally true, that many of the sexual diseases and accidents of women still remain involved in no little obscurity; that the more popular of the theories in regard to their pathology are unsatisfactory, while the means proposed for their amelioration or cure, are productive of comparatively little or no good. It is with pleasure, therefore, that we record the appearance of every new work on the diseases and accidents of women from an author of repute and experience, in the hope that from his observations and investigations some portion, at least, of our lack of knowledge in respect to those diseases and accidents may be supplied, and a greater unanimity arrived at as to their proper treatment.

The work of Dr. Byford is the latest that has appeared upon this subject. The author lays no pretension to entire originality, but presents the volume as "a concise, though sufficiently complete, practical, and reliable treatise," adapted to the wants of the student and junior members of the profession.

It comprises, certainly, a very fair *résumé* of the present condition of our knowledge on the subjects treated of in its several chapters. The author advances no particularly novel views, either pathological or therapeutical. He professes, however, to have tested the current opinions as to the nature and causation of the leading diseases and accidents peculiar to the female sex, and the means recommended for their amelioration or cure, by the results of his own extended observations and experience, and to have rejected all those which have not been sustained by such test. In this point of view, alone, the work is invested with no trifling interest, and will be received as a valuable addition to the standard works that form the basis of every physician's library.

In no department, perhaps, of medicine do we find so large a number of one-sided observations, and such an amount of false experience, as in that which embraces the especial diseases and accidents of the female sex. Some of the errors in pathology and practice which have in consequence resulted are pointed out by Dr. Byford; there are, we believe, many others which call as loudly for correction, and which have entirely escaped his scrutiny. The entire subject of displacements of the uterus requires, it is apparent, a more thorough and careful investigation than it has as yet received, in order to a more accurate determination of their true pathological signification, their frequency, the morbid phenomena to which they actually give rise, their causes, and the most appropriate means for their rectification; including, necessarily, a cautious and systematic examination into the value of pessaries, of the various forms and materials proposed by different practitioners, and the cases, if any, to which they are respectively adapted. The remarks of Dr. Byford on the use of the pessary are sufficiently cautious, and his enumeration of the circumstances under which its use is impracticable is sufficiently full; while his exposition of the evil effects caused by the abuse of the instrument would seem to be sufficiently pointed to deter all who shall carefully study it from an incautious and too frequent resort to them; nevertheless, he has not fairly met the main question, Do pessaries, the presence of which, confessedly, in many cases cannot be tolerated, and in others, from their improper use, are productive of serious mischief, effect in any case an amount of good, even when properly and skilfully employed, sufficient to counteract the dangers resulting from their abuse? We rather think that in his very limited commendation of pessaries, Dr. Byford has given in to the pressure of external authority on this question, rather than followed out the results of his own personal clinical experience.

The subject the most extensively discussed in the volume before us, is inflammation, acute and chronic, of the uterus and its appendages. Fourteen of the thirty chapters into which the treatise is divided are devoted to this subject alone. Inflammation, especially in its chronic form, constitutes the very basis of Dr. Byford's female pathology. Not only are the several groups of symptoms, which have been erected by the older writers, into independent diseases supposed to originate in uterine inflammation, but also nearly every ache and pain, every feeling of uneasiness to which woman is liable.

We have read the several chapters devoted to the history of inflammation of the womb and its annexes, its etiology, complications, progress, results, diagnosis, and treatment with deep interest. Though we believe that Dr. Byford has exaggerated the frequency of the occurrence of inflammation of the womb, and has laid it down as the cause of various morbid phenomena in cases in which it can exert no such agency, yet, with these exceptions, the subject has been unquestionably treated by him with much ability, and a careful study of this portion of his treatise will, we take pleasure to say, communicate much valuable practical information to "the student and junior practitioner."

Dr. Byford's account of puerperal fever is by no means very clear or satisfactory. He would seem to include under the term puerperal fever, every febrile affection of the recently delivered female, whether connected with inflammation of the womb, its sinuses, veins, etc., with utero or general peritonitis, or with toxæmia; the less or greater malignancy exhibited at different times by each of these forms of disease depending, as he believes, in great measure upon its occurring sporadically, or as the result of some endemic or epidemic cause.

With Dr. Byford we would willingly reject entirely the term puerperal fever as one never strictly applicable to any of the diseases incident to the puerperal state, and from the loose manner in which it has been used, leading to the utmost confusion and the most serious errors in respect to the maladies liable to occur in child-bed. Confusion and errors which would be but little amended by adopting the term puerperal fever in only a generic sense, with a specific affix to define its meaning in the different cases to which it is applied.

We do not believe that all febrile affections occurring in puerperal females are identical, though we admit that they are all very greatly modified by the puerperal state, and, occasionally, by some prevailing epidemic or endemic influence. Our experience in conjunction with a pretty extended investigation of the subject has taught us that puerperal women are liable to a fever of the most formidable character, originating from a zymotic cause, traceable, in some instances, but not in others; a fever altogether independent, in every case, of inflammation, although such inflammation most generally occurs in the course of the disease as a secondary affection. This fever is a disease not peculiar to the puerperal female, but may occur also in the non-pregnant, the virgin, the male. It is propagatable by contagion or by infection, which latter will often adhere with great tenacity to the wards of a lying-in hospital, so as to propagate the disease to those who occupy them, even some time after they had been evacuated, and, apparently, thoroughly cleansed and aired.

That the disease just referred to, when it occurs in the recently delivered female, constitutes the most formidable of the febrile morbid conditions which have been included under the very loose term puerperal fever, can be established by an overwhelming mass of the most incontrovertible evidence.

Without formally recognizing the fact referred to, Dr. Byford, nevertheless, accedes to its correctness in his description of what he denominates the *toxæmic* form of puerperal fever. This description, although confused, and, in some respects, contradictory, has, in its general outlines, been very evidently drawn from the disease to which we refer as the most severe, unmanageable, and quickly fatal of the forms of fever, with which the puerperal female is liable to be attacked.

The chapters on uterine and ovarian tumors are marked by good sense and commendable caution. They embrace a tolerably clear and, though very concise, a fair exhibit of the present state of medical opinion in respect to the subjects treated of. The same may be said of the chapter on diseases of the mammæ. The one on phlegmasia dolens, or crural phlebitis, is clear and accurate and highly instructive.

We would beg leave to remark that in the case of a new edition of the work of Dr. Byford being called for, and we see no reason to doubt that such will be the case, the Latinity of the several prescriptions given in it will require a careful revision. It is now, certainly, anything but correct. It is to be hoped, also, that the bad taste of combining in the same prescription Latin and English, will be avoided.

We have remarked that the name of Dr. Robert Lee, author of the well-known and highly valuable work, *Researches on the more Important Diseases of Women*, is invariably misspelled by Dr. Byford, *Hay*. D. F. C.

ART. XX.—*Materia Medica for the Use of Students.* By JOHN B. BIDDLE, M. D., Professor of Materia Medica and General Therapeutics in the Jefferson Medical College, Member of the American Philosophical Society, Fellow of the College of Physicians, etc. etc. With illustrations. 8vo. pp. 359. Philadelphia: Lindsay & Blakiston. 1865.

THIS is a second edition, revised, enlarged, and adapted to the last edition of the United States Pharmacopœia. The author does not design his work "to take the place of the more voluminous and systematic treatises upon the subject," but he believes, nevertheless, "that it will be found to contain a succinct account of all the articles of the Materia Medica in use in this country, and to furnish a suitable text-book to the courses of lectures delivered upon the branch."

The descriptions of the articles are summary in character and calculated to assist a student in answering questions propounded by a "quiz-master," or by a professor who may make use of the work as a syllabus of his teachings; but it is conjectured that from it alone a student could not acquire a sufficient knowledge to enable him to prescribe medicines satisfactorily, if it is necessary to discriminate in the application of articles which possess a common or analogous property or power, as, for example, jalep, scammony, gamboge, elaterium, and croton oil, all of which are termed hydragogue cathartics; but, whether all are equally adapted to all cases in which some hydragogue cathartic is recommended is not stated. Such objection, however, is not more applicable to this than to other *compendiums*. As a fair specimen of the succinct manner in which the author treats the subject, we copy, in full, his account of colocynth.

"COLOCYNTHIS—COLOCYNTH.—Colocynth is the FRUIT (deprived of its rind) of Citrellus Colocynthis or Bitter Cucumber (*Nat. Ord.* Cucurbitaceæ), an annual plant of the south of Europe and parts of Asia and Africa, resembling the common watermelon. The fruit is *peeled* and dried for exportation, and comes to us from the Levant. It consists of light, whitish, spongy balls, about the size of a small orange, filled with numerous seeds. For medical use, the *pulp* only is employed, and the seeds, which are inactive, are rejected. The pulp has a feeble odour, and a nauseous, intensely bitter taste. It yields its virtues to both water and alcohol, and contains a peculiar bitter principle, termed *colocynthin*, resin, &c.

"*Effects and uses.*—Colocynth is a violent hydragogue cathartic, acting sometimes very harshly even in small doses, and in overdoses producing dangerous and occasionally fatal enteric inflammation. The dose is gr. v to x. It is seldom, however, administered alone. In the form of *compound extract* (which contains also aloes, scammony, and cardamom), it is a favourite prescription—dose gr. v–xx; and the compound extract, combined with the extract of jalap, calomel and gamboge, constitutes a very popular compound, known as *compound cathartic pills*."

This description of colocynth would be improved for practical application and reference had the proportional quantities of the ingredients of the compounds named been stated. The reader of this compendium would refer to it in vain to ascertain how much calomel a compound cathartic pill contains, an item of information which it might be desirable to possess.

An elementary work on materia medica would be more useful if it embraced also some definite instructions on the modes of administering certain medicines. We are told (pp. 78–9), that ammoniac is a gum resin used chiefly "as an antispasmodic expectorant," and, "dose gr. x to xxx. A *mixture and plaster* are officinal." But the student might desire to know whether the dose of from gr. x to xxx of the gum-resin ammoniac is to be given to the patient in the form of pill, mixture or plaster, and at what intervals of time it should be repeated.

The book teaches that subnitrate of bismuth is prescribed in the "dose, gr. v to ℈i, or even ʒss, in powder or pill. Externally it is a good remedy in skin diseases in the form of ointment." How is the patient to dispose of a scruple or half drachm of subnitrate of bismuth in powder? Is it to be taken into the mouth dry, or mingled with water or syrup? How is a half drachm dose to be made into pill, and of how many pills should the dose consist?

Acidum nitricum dilutum; (p. 125) "dose, for internal use, 20 to 40 drops, three times a day, reduced with water."

How much water is enough to dilute forty drops of dilute nitric acid (specific gravity 1.068), to prevent it from irritating the surface with which it is placed contact?

Under the title arrowroot we find the following: "It is dissolved in boiling water (a tablespoonful to water Oj), and forms a gelatinous solution; a larger proportion of arrowroot makes a jelly-like mass." Prepared according to the method suggested in this direction, namely, to pour a pint of boiling water on a tablespoonful of arrowroot, or, to put a tablespoonful of arrowroot into a pint of water at the boiling temperature, the article would not be in its most acceptable form.

We do not regard the small objections implied in the above citations as especially applicable to the work before us, because the same and analogous imperfections exist in most if not in all treatises on materia medica, not excepting even the classic works of Pereira, Royle, Wood and Bache, and others. Yet, in our humble judgment, the practice of medicine would gain something by having students taught, while they are learning materia medica, the methods and forms of administering medicines, especially such as require peculiar manipulation to render them fit to be offered to the lips of the patient. In cities where there are skilful druggists and expert nurses, it may be enough that the physician name the article and dose he deems proper for his patient. But in the country, in rural districts, in the army and navy, practitioners are required to be able to give detailed and minute directions not only about the administration of medicines, but also about the preparation of diet for the sick, and if they are ignorant of these details, upon the proper execution of which the comfort of the patient and success of treatment so often depend, there is no one at hand to supply the needful though simple information.

It is a fashion to overlook in medical descriptions, the unvarying standards of weight and measure which have been established and to take those which are uncertain, vague and changing. The fruit of colocynth is said to be "the size of a small orange," for example, yet the orange which would be called small in Brazil would be termed large in China: oranges may be from one and a half to four and a half and five inches in diameter and not be either small or large in comparison with those grown in the same locality. Similar remarks are applicable to the phrases "big as a hickory-nut," "big as the end of my thumb," "the size of a filbert," "big as an apple," and "high as Christ-church steeple," which was a classic unit of measure of height among the earlier citizens of Philadelphia.

Teachers of the science and art of medicine and surgery might abandon this fashion, advantageously for students, and apply the established standards of weight and measure instead. It seems preferable, even if nothing be actually gained, to direct that a dose shall be administered in a stated number of ounces or other uniform measure, than to employ the too common expressions, in "some" or "a little water," or "largely reduced," "slightly diluted," &c. But, it is believed that precise teaching in these apparently unimportant details is calculated to impress on the mind of the student the habit of being accurate in whatever relates to the art of prescribing and administering medicines.

The "Materia Medica for Students" is well written, clearly printed, and the twenty-four illustrations, though not very elegant specimens of the wood-engraver's art, fairly represent the general aspect of the plants they are designed to portray. It will be found a useful hand-book, by those students especially who may be under the instruction of its able and accomplished author.

W. S. W. R.

Art. XXI.—*On the Direct Influence of Medicinal and Morbific Agents upon the Muscular Tissue of the Bloodvessels.* By R. Cresson Stiles, M. D., etc. "Non fingendum, aut excogitandum, sed inveniendum." Read before the King's County Medical Society, Brooklyn, March 21, 1865. 8vo. pp. 26. New York, 1865.

We have failed to discover whether Dr. Stiles, in attempting to show that the action of morbific agents—in the production of disease and that of remedial agents in its arrest—is exerted, through the medium of the blood, upon the muscular tissue of the bloodvessels, would restrict this to certain forms of disease, and to particular morbific and therapeutic agents, or extend it to all agents by which disease in every instance is induced, and, when induced, is either arrested in its course or conducted to a favourable issue. In the exposition of his views

Dr. Stiles has not observed that clearness and precision which are essential to a correct understanding of them in all their bearings.

It is very certain that Dr. Stiles believes the morbific matter, whatever this may be, to which the production of every form of fever is due, enters into, or is generated in the blood; and that the blood thus poisoned, by its action upon the bloodvessels, causes a general relaxation of their muscular tissue, and, in consequence, an augmented pressure in the arterioles and capillaries, with an increased rapidity of the circulation generally.

Fever is defined by Dr. Stiles to be "an acute morbid activity of the general circulation and vital combustion, caused by the direct action of a blood poison upon the muscular tissue of the bloodvessels." Increased activity of the circulation is generally, he remarks, regarded as the fundamental element of the febrile state, the remaining phenomena of fever being its natural results, or mere concomitants. He associates, he informs us, with the expression "*vital combustion*," no theory of animal heat, but would simply indicate the symptom from which fever derives its name.

Dr. Stiles has endeavoured to show—and it appears to us not without success—1. That no simply nervous theory is adequate to furnish an explanation of febrile phenomena; 2. That febrile phenomena cannot be explained alone by simply increased activity of the heart; and, 3. That the nervous disturbances exhibited in every case of fever are secondary or coincident, not fundamental and essential.

"The cause of the fever may lie, indirectly, in severe mental strain, or in some overpowering sorrow; the cause may persist in all its force when the fever is aroused, and, happily, often removes the system from nervous sway, and saves a life which would otherwise fail to sustain the nervous tension. A blood poison has been produced through the agency of the nervous system, which, by acting on the muscular tissue, has released the system from nervous control, and generated the fever. The admission of such an element is a necessity, for 'fever is more than the resilience of a bowed-down system,' and is warranted by the fact that the production of vitiated fluids through nervous agency is a matter of not unusual observation."

The essay of Dr. Stiles, though very far from being conclusive as to the validity of the leading views advanced in it, is nevertheless highly suggestive throughout, and may be studied with profit. Even though it lead not to the adoption of the views advanced in respect to the mode of action of morbific and curative agents, nor of the theory of the causation of fever set forth, yet there are some observations in the essay which are calculated to improve our knowledge of the etiology and therapeutics of the class of febrile diseases.

D. F. C.

ART. XXII.—*Obscure Diseases of the Brain and Mind.* By FORBES WINSLOW, M. D., D. C. L., Oxon. etc. etc. etc. Second American, from the Third and Revised English Edition. 8vo. pp. 348. Philadelphia: Henry C. Lea, 1866.

THE author of this work, by his numerous writings, among which we may enumerate the Lettsomian Lectures before the College of Physicians on *The Psychological Vocation of the Physician*, his essays *On the Medical Treatment of Insanity*, on *Medico-legal Evidence in Cases of Insanity; The Anatomy of Suicide; The Plea of Insanity in Criminal Cases*, his *Psychological Journal*, and the volume now under notice, has given an immense impulse to the study of insanity, and contributed largely to the elucidation of mental disorders, particularly those of an obscure character, and which had previously been too commonly overlooked. By unravelling the phenomena of mind in its natural state, he has led the way to a better knowledge of its diseased condition, and to the recognition of the premonitory symptoms—the *incubation*, as he calls it—of insanity.

The first edition of this work was reviewed at the time of its appearance (see number of this Journal for October, 1860), and we may state that the favourable opinion of it then expressed, has been confirmed by the sale of two large editions of it in England within three years, and one edition in this country. The third edition, of which the present American is a reprint, we find on examination to have been carefully revised throughout, and to be eminently worthy of the attention of the profession.

ART. XXIII.—*An Inquiry into the Possibility of Restoring the Life of Warm-blooded Animals in certain cases where the Respiration, the Circulation, and the Ordinary Manifestations of Organic Motion are exhausted or have ceased.* By BENJAMIN WARD RICHARDSON, M. A., M. D. 8vo. pp. 15. (From Proceedings of the Royal Society, June 15, 1865.)

IN this highly interesting memoir, the author, by a series of ingeniously devised and carefully performed experiments, has shown the reasons why the restoration of action in cases where life is suspended is at present so doubtful and difficult. The memoir is divided into two parts, the first containing the details of experiments, the second of an analysis of the experimental evidence with the conclusions to which the author has been led.

In the experimental inquiry, the animals operated on were subjected to such means for suspending their animation as produced the least possible change in the structure of organs, such as chloroform, carbonic acid, and drowning.

Throughout the inquiry, Dr. R. states, "I have kept steadily in view a process for restoring the development of force which is constantly and successfully being performed. A simple process enough! I mean the relighting of a taper. I see in the taper as it is burning the analogue of living action. The combustible substance having the force stored up in it circulating through the wick as through so many vessels, becoming distributed in the presence of incandescent heat so as to combine with oxygen; then itself liberating force, burning, and in the process showing spontaneous action, the analogue of living action.

"From this analogy I gather, further, that if I could set the blood burning as it burns in life, after its natural combustion has been suspended, I should relight the animal lamp, and that the redevelopment of force in the form of animal motion, which is life, would be re-established.

"But how in the case of the animal body is the light to be applied? That is the difficulty.

"Suppose that the taper or the fire were known only to us from their spontaneous manifestations, would the task to restore their burning if that had gone out be less difficult? What philosophical process should we adopt? We should first most naturally take fire from fire when that were possible. But how, when that were not possible, should we proceed to obtain the spark for kindling that which we might well know would burn spontaneously after kindling, the proper conditions being supplied? In such case we should most naturally look for the process by which fire is spontaneously exhibited, and we should discover it in the friction of one body with another; in the friction of stone, for example, with iron. Straightway we should imitate this and produce fire, and know how to renew and perpetuate it.

"Again, in our observation of burning bodies we should see often that a point of flame well-nigh extinguished would rekindle under a little additional friction of air, or an additional communication of matter that would burn, and we should acquire an art of sustaining fire by these measures.

"Lastly, as we went on observing we should discover that the force elicited in the combustion could be so applied as to set in motion almost endless mechanism; and we should learn, as we have learned, that however complicate the mechanism, however numerous its parts, it takes all its motion from the fire.

"The physiologist who would distinguish himself by learning the art of resuscitation must, I have thought, place himself precisely in the same condition as the primitive man who, in the matter of ordinary combustion, would pass to the civilized man through the phases I have described; and it seems to me that, so far as we have progressed, we have become acquainted with three natural steps in the inquiry at least. We have discovered that when the animal fire is declining from want of air, it may be fanned into existence again by gentle friction of air. We have learned by an experiment, first thoroughly demonstrated before the Royal Society in the early days of its remarkable history, that when the animal fire is waning, owing to deficiency of fuel, that is to say, of blood, it may be revivified by the direct introduction of new blood. Lastly, we have learned that the natural or spontaneous combustion of blood is due to the affinity of the oxygen of the air for combustible substance in the blood, when such substance is presented to the air over a sufficient extent of surface."

And further Dr. R. believes that the motion of the animal (the action of its mechanical parts) is produced by the force evolved in the process of combustion.

Dr. R.'s experiments "have reference to the best means to be adopted for fanning into active life the animal fire that is expiring but is not suspended. But they extend also to the deeper questions, whether animal combustion cannot be re-established when it appears to have been extinguished? and whether so-called vital acts would not be spontaneously manifested upon such re-establishment of animal combustion?

"In the part of this paper which contains the details of experimental research, the experiments are classified in three series.

"The first series of experiments has reference to attempts made to produce combustion of blood in the lungs by the introduction of air—*Artificial Respiration.*

"The second series embraces experiments in which attempts were made to induce circulation of the blood by physical operations—*Artificial Circulation.*

"The third series supplies the records of experiments in which the effects of *an increased temperature* upon the body were observed.

The following is a *résumé* of the results of Dr. R.'s experiments as to the value of artificial respiration:—

"Reviewing the whole series of experiments, I am led to the conclusion, and I think it admits of direct demonstration, that artificial respiration, in whatever way performed, is quite useless from the moment when the right side of the heart fails in propelling a current of blood over the pulmonic circuit, and when the auriculo-ventricular valve loses its tension on contraction of the ventricle.

"*Break of blood-column.*—At this point the blood-column is broken: the resistance to the passage of blood is of itself almost overwhelming, while the muscular action is decreasing in power in proportion as the difficulty of propulsion is increasing.

"*Obstacle from coalescence of blood-corpuscles.*—Another obstacle is in the blood itself. It consists in the rapid coalescence of the blood-corpuscles as the motion of the blood ceases. This is so determinate, that within three minutes after its complete cessation, the blood, though still fluid, often fails to be carried, even by a moderately strong stroke, over the lungs. In one experiment the chest of a strong dog was laid open while the animal was under chloroform, and artificial respiration was sustained. Both sides of the heart were acting vigorously, and there was a good arterial current. In the midst of this action, which could easily have been sustained for an hour, the pulmonary artery was suppressed for the space of two minutes and fifty seconds. Then it was liberated, and the ventricle, which was still beating vigorously and gave out a valvular sound, carried the pent-up column into the pulmonary vessel; but there was no circuit. The lung was somewhat congested, and the capillaries were blocked up so as to resist an impulse which, increased by galvanism, was more active for some minutes after the liberation of the artery than it had been previously.

"*Obstruction from coagulation of blood.*—The last obstruction is the coagulation of the blood; but as this does not, as a general rule, occur (in cases where the bloodvessels are not opened) within twenty minutes, and often not within an hour, it may be considered a secondary difficulty, though naturally fatal to success, according to our present knowledge, when it has taken place."

With regard to the modes of applying artificial respiration, and the time, the facts are as follows:—

"1. It is unnecessary and even injurious to employ it so long as there is any attempt at natural respiration.

"2. Before employing it, the patient should be placed with the head slightly lowered, a position which will largely assist the right ventricle in any feeble effort it may be making to propel a current of blood into the pulmonic circuit.

"3. It is of the greatest importance that the air conveyed into the lungs should be at a temperature above 60°; air below that temperature should never be used.

"4. All violent attempts to introduce large quantities of air are injurious; for whenever the pressure of the blood from the right side of the heart is reduced, the danger of rupturing the air-vesicles by pressure of air is increased. In a word, the practitioner should remember that he is doing the same act, virtually, in artificial respiration, as he is when attempting to relight an expiring taper. Any violence will only disarrange the mechanism, and turn the last chance of success into certain failure.

"5. So long as care be taken to sustain a gentle action of respiration, it signifies little, in my opinion, what means be employed. I have found a double-acting bellows, described in the experimental part of this paper, answer every purpose fairly. If any philosophical-instrument maker could invent a good and portable electro-magnetic machine with my metronome principle applied to it, so that from fifteen to twenty shocks per minute could be passed from the larynx to the diaphragm directly, the most perfect attainable artificial respiration would be secured so long as any muscular irritability remained; and I should suggest the value of such an instrument in cases where it could be brought into operation immediately after natural respiration has ceased. In combination with air heated from 120° to 140° for inhalation, every possible advantage that could accrue from artificial respiration, or rather from respiration artificially excited, would be secured, the persistence of muscular irritability being at the same time a sure index that the effort should not cease."

The observations Dr. R. has made in regard to heated air, leads him to suggest that in all receiving-houses for the drowned "a room should be set apart the air of which should be at 140° in summer, and 130° in winter. If bodies taken out of the water showed any indications of breathing, it would be sufficient, in my opinion, to place them in such an atmosphere, simply providing by the position of the body for the escape of water from the lungs. There would be under such conditions quick evaporation of water adhering to the bronchial surface, while the warm air would quicken the respiration, encourage the action of the heart, and prevent radiation of heat from the body. If artificial respiration were considered necessary, its performance in such an atmosphere would render the possibility of recovery far greater than if a low temperature and a moist state of atmosphere prevailed."

The second series of experiments were made with a view of ascertaining the effect of various physical means in restoring the circulation. Various processes were adopted. "In one class of inquiry oxygen was gently infused into the circulation, either in the form of gas, or in solution as peroxide of hydrogen, in order to see if by this means the heart could be stimulated into active contraction. In other instances water heated to a given temperature was injected, or the vapour of water. Again, electricity was brought into play; and, lastly, various mechanical contrivances were introduced, either for forcing the blood over the system or for drawing it over."

From his experiments with oxygen introduced into the circulation directly, Dr. R. infers that this agent "possesses the power of calling forth muscular contraction. This power seems to be due to the combination of the oxygen with a little blood remaining in the circulatory channels, and to the evolution of force from that combination. The effect of the oxygen, therefore, is extremely limited; and when introduced in the gaseous form, the distension it produces leads to a certain degree of disorganization of structure. I do not at this moment see, therefore, that oxygen admits of being applied as a direct excitant of the heart; but it is worthy of remembrance that the element produces temporary excitability when diffused through muscular structure recently rendered inactive."

Many attempts were made to restore the circulation by means of heat conveyed into the vessels by heated fluids. Dr. R. "first observed that when vapour of water (steam) at a temperature of 130° was driven into the arteries, there was at once rapid and general muscular action, the heart participating in the movement, but less actively than the voluntary muscles."

Dr. R. also used simple water for injection "heated to various degrees, from 96° to 130°. When water is thus injected, the animal being only a few minutes dead; and the water not being below 115° Fahr., the extent and activity of the muscular contractions are even more marked than when galvanism is brought into action, but in the greater number of cases the effect of the warm water ceases in from fifteen to twenty minutes." Dr. R. attributes the action produced on the muscles to the heat evolved by the water.

Blood held fluid by alkali, oxidized and heated to 96° was employed, but it excited no response on the part of the heart.

"Electricity, in the form of electro-galvanism, was employed in several experiments and in various ways to excite the heart. The little battery of Legendre and Morin, with the addition of the metronome so as to regulate the stroke, was the instrument used, and artificial respiration was combined with the electric process."

The inference which Dr. R. draws from his experiments with electricity on the heart is, "that by rapidly establishing a direct circuit between the blood in the right side of the heart and the external surface of the organ, using a moist conductor from the positive pole for the external surface, a sufficient contraction may (I had almost said, by a fortunate accident) be induced in the right ventricle to drive over the pulmonic current of blood, and to allow of its oxygenation by artificial inflation of the lungs. This fact at first sight looks small; but I value it beyond measure, because it has demonstrated that, when the action of the heart has ceased, the chest of the animal being open and all the conditions for reanimation being most unfavourable, the mere passage of blood from the right to the left side of the heart is sufficient to re-establish the action of the left side; that the left side thus reacting can throw a blood-current into the arteries; and that upon the reception of blood by the system, general muscular action and rhythmical action of the muscles of the chest are reproduced." This agent it must be observed is, however, not devoid of danger.

"My experiments," Dr. R. remarks, "clearly showed that the natural muscular irritability, while it is for a short time made more active by galvanism, is shortened in duration. This is natural. The irritability of muscle is in proportion to the degree of force which remains in it after the blood is withdrawn which force is evolved in proportion as it is called forth. It is well, therefore, in applying galvanism for any purpose to the subject in whom the action of life is suspended, to use the agent for one definite object, and to remember that, in proportion as it is used, its power for good diminishes."

In the last division of the physical series of experiments "the object held in view was to set the blood mechanically in motion through its own vessels. The attempts were made (*a*) by forcing blood towards the right side of the heart and into the lungs by the action of a syringe fixed in a vein, (*b*) by trying to draw over a current of blood into the arteries from the veins and over the lungs, (*c*) by trying to inject the heart of one animal with blood derived from another animal."

Dr. R. inquires whether a fluid resembling arterial blood, and capable either of being readily compounded when required, or of being kept ready for use, and capable also, when heated to 98° of restoring the muscular power of the heart, may not be invented. If it can, then the operation of injecting the heart by a carotid or brachial artery will, he says, be the most important practical step yet made towards the process of resuscitation when the motion of the heart has been arrested.

If such a fluid could be discovered, Dr. R. states that "it would be necessary in using it, to feed the heart, not in one continuous stream, but stroke by stroke, as in life; for it seems to me that the stroke supplements or, more correctly speaking, represents a certain measure and regulation of the force derived from the combustion of the blood."

In a note appended to this paper. Dr. R. makes the following important statement: "Since this paper was laid before the Society, I have determined by a direct experiment that rhythmic stroke is of the first importance in restoring muscular contraction. By means of a machine which can either be worked by the hand or by electro-magnetism, I was enabled, assisted by my friends Drs. Wood and Sedgewick, to introduce blood heated to 90° Fahr. into the coronary arteries of a dog by rhythmic stroke, and at the same rate as the stroke of the heart of the animal previously to its death. The result was, that one hour and five minutes after the complete death of the animal, its heart, perfectly still, cold, and partly rigid, relaxed, and exhibited for twenty minutes active muscular motion, auricular and ventricular. The action, which continued for a short time after the rhythmic injection was withheld, was renewed several times by simply re-establishing the injection."

The third series of experiments were conducted to ascertain the effects of external heat applied to the body that has ceased to show evidence of life. "In no case was there any restoration of vitality; but it was observed that those parts of the body that had been more directly exposed to the heat showed the earliest indications of cadaveric rigidity. In the experiments where death took place from chloroform, and where the animals had been exposed to a temperature of 100°, the heart at the end of an hour was found still excitable, and on the right side was contracting well without the application of stimulus. This did not occur in the cases of death from drowning and carbonic acid, nor yet in cases where the warmth was carried above the natural temperature. These observations are of moment as indicating two facts—viz., that chloroform is less fatal as a destroyer of muscular irritability than either carbonic acid or the process of drowning; and that in the application of temperature to the external surface of the body by the bath, it is not advisable to raise the temperature many degrees above the natural standard."

The following are the author's general conclusions and indications:—

"I have already shown that artificial respiration is of service only when blood from the heart is being still distributed over the capillary surface of the lungs—or, to return to the simile with which I set out, that the process is simply one of fanning an expiring flame, which once expired will not, in spite of any amount of fanning, relight. The further conclusion to which I am at this moment led, goes, however, beyond the process of artificial respiration; returning again to the simile, I venture to report that, even when the heart has ceased to supply blood to the pulmonic capillaries, during the period previous to coagulation, the blood may be driven or drawn over the pulmonic circuit, may be oxidized in its course, may reach the left side of the heart, may be distributed over the arteries, and that, thus distributed, it possesses the power of restoring general muscular irritability and the external manifestations of life. Hence I infer that resuscitation, under the limitations named, is a possible process, and that it demands only the elements of time, experiment, and patience for its development into a demonstrable fact of modern science."

Dr. R. is still engaged in this experimental inquiry, and we shall look for his future results with great interest.

ART. XXIV.—*The Practice of Medicine.* BY THOMAS HAWKES TANNER, M. D. F. L. S., M. R. C. P., Vice-President of the Obstetrical Society of London, etc. etc. etc. From the fifth London Edition; enlarged and improved. 8vo. pp. 835. Philadelphia: Lindsay and Blakiston, 1866.

IN its passage from the first to the fifth edition, the work of Dr. Tanner has gradually increased in size from a thin duodecimo volume to its present proportions of a goodly octavo of over eight hundred pages. With its growth in size, its comprehensiveness as well as the general value of its contents has augmented in an equal ratio. It may now be received as a tolerably full and accurate compendium of the practice of medicine, and a useful text-book for the use of the student whilst in attendance upon a course of medical lectures.

The leading requisites of a work like the present are, conciseness, so far as this may be consistent with perfect clearness, and accuracy in all its teachings, so that they shall be a true reflection of the facts and observations which have received the sanction of the most reliable medical authorities. So far as conciseness and general accuracy of teaching are concerned, we have but little to object to the volume before us, viewed in the light simply of a compend of the practice of medicine. The leading objection we have to the work is the very unequal execution of its several parts, many of the forms of disease of common occurrence, and of paramount importance from their extreme severity, and the disputes which exist among physicians as to their causation, their seat, their nature, and their treatment, have but a few brief sentences devoted to their consideration, while to the discussion of others of far more rare occurrence, less severe in their character or which are better understood in respect to their pathology and management, far more space is allowed.

From the fact that the treatise of Dr. Tanner has reached, within a comparatively few years, its fifth edition, it is sufficiently evident that works of the class to which it belongs are in demand. Now if this demand is not properly supplied, it will most certainly be by miserable compilations more apt by far to mislead than to instruct; hence the importance of stamping with approval such works of the class as present nothing especially exceptional in matter—no glaring errors in the principles they advocate or in the practical precepts they inculcate. Of such a kind we believe to be the work before us, and as such we recommend it to the notice of students and graduates who are in search of a tolerably full and faithful manual of the practice of medicine. D. F. C.

ART. XXV.—*The Principles of Surgery.* By JAMES SYME, F. R. S. E., Professor of Clinical Surgery in the University of Edinburgh, &c. &c. &c. To which are appended his treatises on "*The Diseases of the Rectum,*" "*Stricture of the Urethra and Fistula in Perineo,*" "*The Excision of Diseased Joints,*" *and numerous Additional Contributions to the Pathology and Practice of Surgery.* Edited by his former pupil, DONALD MACLEAN, M. D., L. R. C. S. E., Prof. of the Institutes of Med. and Lecturer on Clinical Surgery, Queen's University, Canada. 8vo. pp. 880. Philadelphia: J. B. Lippincott & Co., 1866.

THIS neat and convenient collection of the principal surgical writings of the well-known veteran Edinburgh operator and teacher of clinical surgery, will be gladly received by a large number of readers on this side of the Atlantic. It is published under express authority given by Professor Syme in answer to an application for the purpose by the American editor, made "in compliance with a request which had frequently and urgently been pressed upon" the latter by his "professional brethren in different parts of the United States and Canada."

Professor Maclean appears to have succeeded well in the object proposed, of associating in one volume with his "Principles," the "most valuable of the author's numerous special contributions to the pathology and practice of surgery;" and in this will probably gratify Mr. Syme's own very natural desire to have his writings known here "in a pure form" as much as he will please and benefit the professional students of this country in bringing the best works of a celebrated teacher within their reach. It is unnecessary to say that these works, as well as their author, have been widely known and esteemed in America. Just thirty-three years have passed since a faithful copy—now before us—of Mr. Syme's first edition of the "Principles" was published in Philadelphia. He had already become a man of mark in his particular vocation as a clinical lecturer and as a leader of great promise in operative surgery. We need scarcely say that nothing has since occurred which shows a tendency on his part either to loiter in his onward course, as he understands it, or to hide his light under a bushel, whether that light shine like other men's or not.

The fifth edition of "The Principles" is a very great improvement on the first one, although identical throughout the first fourteen of the present twenty-five chapters. The same clearness and force of language and compactness of discussion; the same practical sagacity, operative skill, breadth of view and independence of judgment, are still more prominent; but, in many places, unfortunately, we encounter the same meagreness and unsatisfactory brevity, due to a dread of "overteaching." These defects will strike even the advanced student of the present day; while the practitioner and the hospital surgeon or the clinical teacher, whether old or young, will be frequently disappointed with the summary dicta of the last edition as they would have been with the numerous omissions of the first, although they cannot fail to find a great deal deal more to admire in the recent edition.

In fact, the advance of Mr. Syme's idea of what such a book ought to be has been so material in the progress of the past thirty years that his latest modification must be regarded as not only an able, but, for most purposes, a sufficiently complete outline of the Principles of Surgery—a text-book, in which, with few exceptions, the leading questions in theory and practice are freely and fairly discussed in the light of the latest general experience. Although the conclusions of the distinguished author are always unmistakably expressed, in accordance with his personal views and experience, they are generally presented with a candor and caution and courtesy which are not characteristic of many of his more ephemeral and doubtless less considered performances. As an instructive body of Surgery from one of the first surgical authorities of the day, it is certainly a valuable addition to our American libraries.

The volume on the Principles, although undoubtedly ample in connection with his interesting clinical instruction and as "a text-book" to his "systematic course," is chiefly important to us because, in his own words, it "contains the principles which I have endeavoured to illustrate in my clinical lectures during the last thirty-four years." His "aim has not been to collect all that might be said in regard to each subject, but rather to select what seemed of most importance, and arrange it in a convenient order for teaching or study, so as to constitute a framework of surgical science, which might be filled up through the gradual acquisition of professional knowledge." Much as we respect his aim and the manner in which he has sought to accomplish it, we should be sorry to recommend his work in place of several which we might name as the "framework" here proposed. There is, doubtless, a golden mean to be attained between overteaching and underteaching; but for truly practical purposes we prefer to go with the crowd of the day, after the bulky volumes, in the search for the *lex scripta* of our science and art; and would rather take the burden of too much teaching, than run the risk of too little.

In this aspect, the addition of the appendix adds greatly to the usefulness of the more systematic work, as it supplies a considerable amount of the clinical illustration and amplification which is avowedly required to complete a full course of instruction. It is unnecessary to notice these additional chapters as they consist of well-known publications, some of them of many years' standing, and all of them essays or reports which have been discussed from time to time in this journal as important contributions to surgery. Our readers will be glad to have them thus brought together in an attractive and available form, because, notwithstanding a few shortcomings and unusual views that may surprise them, here and there, they will find much that is practically useful, in addition to the numerous topics, including modes of treatment and important operations, with which the name of Syme is inseparably connected.

The American editor will have numerous sympathizers with himself and his fellow-pupils in their faith in their unquestionably eminent "old master and friend;" but, with all our admiration for the many sterling qualities of that master, we cannot agree to the wisdom or justness of Dr. John Brown's eulogium quoted in the preface. It is rather too extravagant an introduction to such a collection of papers as these of Mr. Syme's, even supposing this "expression of their sentiments" to possess the accuracy and eloquence which Dr. Maclean so gratefully accords to it. Such fancy-work may do very well for the entertaining pages of the author of "Spare Hours" and of "Rab and his Friends," but is not likely to make much impression of the kind desired upon the readers of the "Principles of Surgery" and of the appended contributions; nor can we believe it will be much more acceptable to their learned and skilful author.

Mr. Syme has spoken his mind and written too much during the last thirty years, not to be generally known as decidedly not the paragon of innocent and unerring devotion to truth and charity which his Edinburgh laureate and quondam disciple has painted him. A man of honest intentions and notoriously strong convictions, with an earnest desire to urge those convictions on his neighbours, and ever exercising an uncompromising boldness and rare ability in illustrating his opinions, Mr. Syme has not always been able to overcome the spirit of prejudice or to conceal its effect upon his views and actions. It would be easy to show that, like many other people of self-confident character, he is not only a good deal of a Cerberus in watching others, but something of a Briareus in dealing with them. He belongs to the class of fulminating prophets in the Esculapian priesthood; and sometimes it has happened in the excitement of his fulminations that it would be hard to tell whether he was trying "to be on the side of truth" or "to have truth on his side." Nor are we disposed to say whether he shines most on these controversial occasions in offensive or defensive warfare.

A man of Professor Syme's acknowledged powers and claims to honourable distinction, both for what he has done and what he has taught to hundreds of patients and pupils throughout a whole generation, is not to be judged by occasional peculiar opinions or moments of weakness; nor is he to be upheld or exalted by a style of laudation which is generally monopolized by the advertising columns of the newspapers. E. H.

ART. XXVI.—*The Essentials of Materia Medica and Therapeutics.* By ALFRED BARING GARROD, M. D., F. R. S. Fellow of the Royal College of Physicians; Professor of Materia Medica and Therapeutics at King's College, London; Physician to the King's College Hospital; and Examiner in Materia Medica in the University of London. 8vo. pp. 439. New York: William Wood & Co., 1865.

THAT teaching the properties, the modes of compounding and combining, and the applications of the very numerous substances employed by physicians and surgeons in the treatment of diseases is very difficult is indicated by the many books published on the subject of materia medica. Most of them are devised with a view to lessen the labour of the student and at the same time render his acquisition of a competent knowledge of the subject easy; but it is very doubtful whether any one of those short roads conduct the learner more rapidly to his object than full and complete treatises, such as the works of Pereira and of Wood and Bache. We venture to assert that the United States Dispensatory by Wood and Bache, which may be regarded as the exposition and complement of the United States Pharmacopœia, is a far better text-book on materia medica for American students than any compilation or compendium yet prepared and published to supersede it.

The purpose of a Pharmacopœia is to obtain uniformity or equality of strength and properties in all medicinal compounds within the region for which it is prepared. In the United States the work is carefully revised every ten years by a convention composed of representatives of the pharmaceutists and medical practitioners in all parts of our immense nation. The Pharmacopœia embodies, it may be presumed, the experimental knowledge of the whole profession, and for this reason is entitled to be respected as the authority on the subject in every part of our country, to the exclusion of every foreign work of analogous character. But there is reason to believe that the Pharmacopœia of the United States is not universally considered the authority by pharmaceutists in all the States. The opii tinctura camphorata, sold in the shops of Boston, Mass., for example, is a different compound from that sold in Philadelphia under the same name, simply because in the latter city the directions of the United States Pharmacopœia are observed, and in Boston a different formula is preferred, in the preparation of the article.

England, Ireland, and Scotland each had its Pharmacopœia, and each differed from the other in the weights and measures employed, and often also in the ingredients of compounds offered to the public under the same name. There was no uniformity. The same prescription compounded in England, Ireland, and Scotland might result in three compounds differing in potency as well as in the ingredients they contained. For the purpose of securing equality of strength and identity of composition in officinal preparations throughout the British islands, the British Pharmacopœia was made to supersede all the others in 1863. The publication of this work, which in many respects is believed to be inferior to the Pharmacopœia of the United States, Dr. Garrod says, in his preface, "rendered it desirable that a text-book should be immediately in the hands of the student and the practitioner of medicine, and hence the second edition of the 'Essentials of Materia Medica and Therapeutics' is now published alone. The author still hopes, in the course of a few months, to bring before the profession a separate volume devoted exclusively to the value of medicines in the treatment of disease, and embracing the whole subject of therapeutics."

The weights employed in the British Pharmacopœia differ from those of any similar work. The pound contains 7000 grains, and is divided into 16 ounces, each weighing 437.5 grains.

Troy weight is used in the Pharmacopœia of the United States. The pound contains 5760 grains, divided into 12 ounces, each weighing 480 grains.

The liquid measure adopted in the British Pharmacopœia differs from the liquid measure of our own Pharmacopœia. The gallon is divided into 8 pints, the pint into 20 ounces, the ounce into 8 drachms, and the drachm into 60 minims. But in the American measure 16 fluidounces make a pint, 8 drachms an ounce, and 60 minims a drachm.

We believe it is important, for obvious reasons, that the Pharmacopœia of the United States should be recognized throughout the country as the authority, the law of the land, if we may use the expression, in strict conformity to which all officinal compounds shall be prepared. All apothecaries and pharmaceutists ought to feel themselves bound in honour to conform to this authority in the preparation of all compounds which are officinal, so that identity of strength and composition shall everywhere prevail.

Inasmuch as the British Pharmacopœia differs in the weights and measures it employs, and in many essential points, from the Pharmacopœia of the United States, we cannot concur in opinion with the American editor of "The Essentials of Materia Medica and Therapeutics," that "The work of Dr. Garrod supplies a want that has long been felt on this side of the Atlantic." We fear the work is calculated to oppose the establishment of that uniformity which it is the purpose of the Pharmacopœia of the United States to obtain; and this objection is not abated by giving the formulæ of both pharmacopœias where they differ in the constituents of a compound, inasmuch as their relative or proportional weights and measures are not the same, even when they agree in component parts. In the latter case, equal measures are not equivalents in dose.

The formula given for tincture of opium by Dr. Garrod, page 175, is, "Powdered opium one ounce and a half [equal to 656.2 grains]; proof spirit one pint. Prepared by maceration. One grain of dry opium is contained in fourteen minims and a half of the tincture." Prepared according to the Pharmacopœia of the United States, in a pint of tincture of opium, 600 grains of the drug are used, and 12.8 minims of the tincture represent one grain of dry opium. The American pint contains 7680, and the British 9600 minims. In the "somewhat copious posological table" (page 419), based on the formulæ of the British

Pharmacopœia, the dose of tinctura opii is stated to be "4 min. to 40 min.;" but it may be shown that 40 minims of the American tincture contain $3\frac{1}{10}$ grains, and the British preparation $2\frac{6}{10}$ grains, or a half grain less of opium.

The American editor claims for Dr. Garrod's work, in connection with the notion that it supplies a want long felt on this side of the Atlantic, that "it gives a succinct but accurate account of the natural history, of the physical and chemical properties of the articles of the materia medica, and of the adulterations to which they are frequently subjected (in England); the physiological action and the therapeutic action of medicines are very concisely given, but the absence of confused and sometimes contradictory details is often an advantage to the student."

In all these particulars, the work before us is like that of the late Dr. J. Forbes Royle, the predecessor of Dr. Garrod in the professional chair of materia medica and therapeutics in King's College, London, but generally inferior to it. The volume of Dr. Royle, ably edited by Dr. J. Carson, was reprinted in Philadelphia, and has been accessible to the members of the medical profession in the United States since 1847. Besides, there has been no dearth of compendious works on materia medica, which are in accordance with our own Pharmacopœia, prepared expressly for the use of medical students. Had the American edition of Dr. Garrod's work contained the formulæ of the United States Pharmacopœia exclusively, without any quotations from or references to the British, London or other pharmacopœias, it would be a much more eligible hand-book or compilation of the subject than it is at present for Americans. The propriety of teaching English students the materia medica, with the weights and measures, and formulæ, according to the Pharmacopœia of the United States in the foreground, and those of the British Pharmacopœia in a secondary position, is the same as offering to instruct American students on the subject from a book in which our own Pharmacopœia is made to occupy a secondary place. British students who are expected to practise medicine in conformity to the British Pharmacopæia, have no need to be made acquainted with the weights, measures, and formulæ of the American Pharmacopœia; and we venture the opinion, that medical practitioners on this side of the Atlantic will not find it necessary to employ British weights, measures, and formulæ instead of our own, and therefore a knowledge of them is to be regarded here simply as a scholarly accomplishment.

Dr. Garrod designed that this volume should serve as a text-book to his own lectures and examinations on materia medica, and be as brief as possible, without omitting anything essential to the British practitioner. This being his self-imposed task, it may be said, he has done his work fairly, and that his pupils will find in this compilation valuable assistance in their studies.

A commendable feature of the volume is, that it embraces formulæ for test and volumetric solutions, with an explanation of their application in analyses of substances contained in the British Pharmacopœia. The table of contents exhibits his systematic arrangement of the subject, and the index is full.

We are not aware of his reasons for spelling the German word fusel, "fousel;" or why he should write "Hæmatoxylum" for Hæmatoxylon, which is the usual orthography.

The mechanical execution of the work is satisfactory, and to those who desire to learn wherein the British and American Pharmacopœias differ, will find this volume useful. W. S. W. R.

ART. XXVII.—*Lectures on the Diseases of the Stomach, with an Introduction on its Anatomy and Physiology.* By WILLIAM BRINTON, M D., F. R. S., Physician to St. Thomas' Hospital. From the Second London Edition. 8vo. pp. 302. Philadelphia: Lea & Blanchard, 1865.

HAVING so recently (See No. for April, 1865) reviewed the English edition of this work, it is sufficient on this occasion to announce the appearance of a neatly gotten up American reprint, and to express our pleasure that this instructive volume is now placed within reach of the profession in this country.

Art. XXVIII.—*A Report upon the Epidemic occurring at Maplewood Young Ladies' Institute, Pittsfield, Mass., in July and August*, 1864: *Including a Discussion of the Causes of Typhoid Fever.* By A. B. Palmer, M. D., Prof. of Pathology, etc. in the University of Michigan, and of Pathology and Practice of Medicine in Berkshire Med. College; and C. L. Ford, M. D., Prof. of Anat. and Physiology in the University of Michigan and Berkshire Med. Coll.; and Pliny Earle, M. D., Prof. of Anat., Med., and Hygiene in Berkshire Med. Coll., and Superintendent of the State Hospital for the Insane at Northampton, Mass. 8vo. pp. 36. Boston: 1865.

The chief interest of this very able report consists in the important bearing the facts it embraces have upon the causes by which a severe local outbreak of typhoid fever may be induced.

It appears that during the latter part of July, 1864, five of the inmates of a well-established and popular ladies' boarding-school, located in one of the most elevated, and, in common estimation, one of the most healthy places in Western Massachusetts, and which at the time was free from any unusual sickness, became indisposed. During some eighteen days up to the 10th of August, when the school closed for the summer, about thirty more of the inmates were sufficiently indisposed to require medical advice. The resident pupils were 77. With the Principal and his immediate family, the resident teachers, and servants, the entire population of the school amounted to about 112 persons. There was also in daily attendance quite a number of pupils who boarded and lodged at their own homes.

Of the first five attacked, four died, on respectively the 2d, 3d, 7th, and 10th of August.

At the closing of the school, August 10th, the pupils hastily dispersed, a few leaving before that time. Some were so ill as with difficulty to reach their homes, while others were obliged to stop on the road until their recovery took place.

A week or two after the closing of the school, two of the day scholars and two or three of the servants were attacked in a manner similar to the others, one of whom died. Reports that sickness and death had occurred among those who had left were received, creating in the community no little anxiety and alarm. To determine, if possible, to what cause or causes existing in the school buildings this outbreak of disease was referable, the authors of the report before us were appointed.

After a very thorough and searching investigation, it was ascertained that of 77 resident pupils, 51 had suffered from unquestionable typhoid fever, and in the majority of cases of a severe form and several weeks' continuance. In addition, 9 or 10 had merely premonitory symptoms, which speedily yielded to treatment; one had dysentery, one slow fever, one anæmia, two were merely reported as unwell, and eight as well, both in the school and for a short time after leaving. Of the 51 cases of typhoid fever, occurring among the pupils, 13 terminated fatally, or about 25.5 per cent.

As to the cause of the endemic just referred to, the committee are of opinion that it "originated essentially" in the state of the privies appertaining to the school buildings, and the inefficient and defective drainage of the entire place. The high temperature of the season and other particular atmospheric conditions, developed, they suppose, in the organic materials accumulated in and about the school buildings, a peculiar poison, in sufficient quantity to pervade the whole premises, and operating for a sufficient length of time to produce disease "in young and susceptible persons, rendered probably more than usually impressible by the protracted heat of the summer, the severity of their labour, and, possibly, by other influences belonging to the season, and to their peculiar conditions."

The entire report is well worth a careful and deliberate study. The facts embraced in it, collected from different reliable sources, inculcate an important hygienic lesson—namely, the part, very commonly overlooked, which is played by old, badly-constructed, and ill-kept privy wells in the production of typhus and typhoid fevers, and other diseases of a low type. D. F. C.

ART. XXIX.—*Lectures on Epilepsy, Pain, Paralysis, and certain other Disorders of the Nervous System.* By CHARLES BLAND RADCLIFFE, M. D., F. R. C. P., Physician to the National Hospital for the Paralytic and Epileptic, etc. etc. 12mo. pp. 280. Philadelphia: Lindsay & Blakiston, 1866.

IN our number for July last we gave a full review of this work; and we need merely, therefore, now only refer to the opinion there expressed of its merits, and announce its republication in this country, thus rendering it accessible to American practitioners. We must add that the volume, both as regards paper and printing, presents a very neat appearance.

ART. XXX.—*Patologia e Terapia delle Malattie Veneree di* F. J. BUMSTEAD, Lettore sulle mallattie veneree al Collegio dei Medici e Chirurghi, Nuova York, Chirurgo all' Ospedale San Luca, Chirurgio all' Ospedale Ottalmico di Nuova York. Prima traduzione Italiana del Dottor CIRILLO TAMBURINI, medico assistente presso l'Ospedale Maggiore di Milano; con note ed aggiunte del dottor AMILCARE RICORDI, Chirurgo del comparto speciale delle malattie veneree nell' Ospedale Maggiore di Milano. Due volume, 8vo. pp. 416 e 562. Milano, 1864.

Bumstead's Pathology and Treatment of Venereal Diseases. Translated into the Italian by Dr. Cirillo Tamburini, Assistant Physician to the Maggiore Hospital of Milan, with notes and additions by Dr. Amilcare Ricordo, Surgeon attached to the venereal wards in the same hospital, Milan, 1865.

IT is four years since we first announced the publication of Dr. Bumstead's work on venereal diseases. The high appreciation to which we judged it entitled, has been universally bestowed upon it, both in this and in foreign countries. It is conceded to be the best practical treatise on venereal affections in any language.

Both the surgeons who have undertaken this Italian edition with notes and additions, have most faithfully accomplished their task. The rendering of the English has been done with care, and the additions, which are numerous, and, moreover, all of them valuable, show the practical experience and literary attainments which might be expected in one holding in surgery the position occupied by Dr. Ricordi.

We have experienced much gratification from an examination of this edition of Dr. Bumstead's work, both because it is pleasing that so good a work should be extensively circulated; and that our medical literature should be so worthily represented abroad. W. F. A.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *On Life.*—Dr. Lionel Beale, in a paper read before the British Association for the advancement of Science at its meeting in September last, commenced by remarking that what he said would be both theoretical and hypothetical. The differences between vital and physical agencies were ably discussed, and Spencer's theory, that assimilation and reason were life, was skilfully combated. Assimilation was not common to the life of all orders where there was certain vital agency. The author alluded to the various kinds of life, and showed that life could not be disturbed or passed through space. The matter in every living cell might be divided into three parts—that which was in a state of life; that which was dead, but had been alive, and that which was lifeless, but would be alive, and after passing through that state would die. The living cell had been compared to a laboratory; but what laboratory was self-serving and self-creating, and what machine could make up waste like the living cell? Dr. Beale noticed the various kinds of life, and proceeded to notice vital movement, in which he remarked that there was no expenditure of force, and alluded to the fact that living matter moves upwards in spite of the attraction of gravitation. The difference between vital power and physical force, and the fact that the one was not attributable to the other, formed the concluding argument of the author.—*Med. Times and Gaz.*, Sept. 23, 1865.

2. *Experiments to determine the Period at which the Spleen is most actively engaged in the Discharge of its Function.*—MM. Estor and St. Pierre, after commenting upon the vagueness of our knowledge of the function of the spleen, remark that only one point is certain, that the spleen undergoes a considerable augmentation in volume in certain physiological conditions, and especially during the act of digestion, whence it has been regarded as simply fulfilling the purpose of a diverticulum. Applying, however, the observations of Bernard, in respect to the change of colour and the quantity of oxygen contained in the venous blood of a quiescent and of an actively secreting gland to the spleen, and from the results of carefully performed analyses, they have arrived at the conclusion that the blood of the splenic vein, during the period of fasting, contains nearly double the proportion of oxygen that is present while gastric digestion is being actively carried on, and consequently that the period of functional activity of the spleen *alternates* with that of the stomach. The mean of six experiments showed that in 100 volumes of *arterial* splenic blood there were contained 14.38 volumes of oxygen, in 100 volumes of the splenic *venous* blood of a fasting animal there were 11.53 volumes of oxygen, and in 100 volumes of the splenic venous blood of an animal in full gastric digestion there were only 5.70 volumes of oxygen.—*Brit. and For. Med.-Chir. Rev.*, Oct. 1865, from *Robin's Journ. de l'Anat. et de la Phys.*, March, 1865.

3. *Deglutition as observed by Autolaryngoscopy.*—M. GUINIER, in a note presented to the Academy of Sciences, arrives at the following conclusions. 1. Deglutition may be effected without occlusion of the pharynx, by the application of the base of the tongue to the posterior wall. 2. The preliminary application of the epiglottis over the larynx is not necessary during the passage of the morsel of food from the pharynx into the œsophagus. 3. The morsel may come into direct contact with the mucous membrane of the glottis; and the mere contraction of the vocal cords is sufficient to prevent it from entering the larynx. 4. The mucous membrane of the base of the tongue, of the epiglottis, and of the interior of the larynx, appears to be endowed with a special sensibility; here the contact of food produces no painful sensation, but merely the need of deglutition, while the contact of a foreign body gives rise to cough or attempts at vomiting.

At the same meeting, a note was presented from Dr. KRISHABER, in which the following conclusions were given: 1. During the act of deglutition, the alimentary morsel passes into one of the pharyngeal grooves along the side of the epiglottis tilted up by the elevation of the larynx; it thus reaches the œsophagus at the moment when, by the action of its constriction, the pharynx is narrowed. 2. Deglutition of liquids is effected in the same way; but they frequently pass over the epiglottis. 3. A small quantity of liquid comes into contact with the mucous membrane of the larynx and even of the vocal cords. 4. In gurgling, the larynx being widely open, a large quantity escapes into the organ. 5. The alimentary morsel is easily tolerated in the larynx as far as the vocal cords and even in the trachea. 6. The sensibility of the trachea to foreign bodies is much less than that of the larynx. 7. Hard cold bodies—a probe for example—are not tolerated in the air-passages; while soft bodies, having a temperature equal to that of the parts with which they come into contact, may remain in the trachea several minutes without producing cough.—*Gazette Médicale de Paris*, July 15, 1865.

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4. *Influence of Galvanism on the Heart.*—Dr. EMILE FLIES, of Berlin, has lately studied, in twenty-four cases, the influence of the constant galvanic stream on the impulse of the heart when increased in frequency and force. In some of the cases, the increase of the heart's action was distinctly traceable to organic disease, and in other cases was probably connected with an increased excitement of the sympathetic nerve-fibres of the heart, which, according to Bezold, act on its musculo-motor central organ, increasing its activity. Starting from the physiological fact, that the vagus fibres of the heart have an action antagonistic to that of the sympathetic—*i. e.*, a depressing influence on the moving power of the organ—he endeavoured to act upon the vagus in the neck at the inner border of the sterno-cleido-mastoid muscle. Dr. Flies found that, after the galvanic current had been employed several times, the intensity of the heart's action was diminished.—*Brit. Med. Journ.*, Sept. 9, 1865, from *Ber. Klin. Woch.*, June 26.

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5. *Experiments on Congelation of Animals.*—M. POUCHET, of Lyons, has communicated to the French Academy of Sciences a long series of experiments made by him on this subject. The following are his conclusions:—

1. One of the first phenomena produced by the action of cold is the constriction of the capillary vessels, immediately made visible by the microscope. So great is the contraction that no globule of blood can gain admission, so that these vessels remain entirely empty, whence the pallor of frozen parts. 2. The next phenomenon is the changed condition of the globules. The alterations observed are of three kinds. (1) The nucleus quits its envelope and swims freely in the plasma, the free nuclei having a granular appearance and being more opaque than in the normal condition. The envelopes of the nuclei become flaccid and torn, or they are dissolved and disappear. (2) The nucleus still remaining within its envelope has become opaque, and is more or less excentrically situated. (3) The globules may be simply more or less indented at their edges and of a deeper colour. It is especially in the blood of reptiles that the nuclei are found expelled, the globules of mammalia presenting indentations. The number of globules which undergo these alterations and re-enter the circulation is propor-

tionate to the extent of the congelation. When this affects only the limbs, $\frac{1}{15}$th or $\frac{1}{20}$th only undergo alteration; but when the animal is totally frozen almost all the globules become disorganized. 3. Any animal that has been totally frozen, all its blood having become solidified and all the globules disorganized, must be regarded as absolutely dead and beyond any restorative power. 4. When the congelation is partial, any organ absolutely frozen becomes gangrenous and is destroyed. 5. If partial congelation has not extended very far, so that but few altered globules have entered the blood, life is not compromised. 6. But when the congelation proceeds over a great extent, the mass of the changed globules which the thawing throws into the circulation rapidly kills the animal. 7. A half-frozen animal may live for a long time if we maintain it in that condition, the frozen blood not entering into circulation; but it dies rapidly if we thaw the frozen parts, the altered globules which re-enter the blood rendering it unfit for the maintenance of life. 8. In all cases of congelation death is due to this change in the blood, and not to the impression made on the nervous system. 9. It results from these facts, that the less rapidly frozen parts are thawed, the less rapid is the invasion of the economy by this altered blood and the greater are the chances of success in the efforts at restoring life.

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6. *Cell-Pathology.*—Dr. J. Hughes Bennett, in a paper read before the British Association for the Advancement of Science at its late annual meeting, stated that cell-pathology had naturally sprung from the cell-theory, as originally framed by its founders, Schleiden and Schwann, which had greatly extended the boundaries of medical science. The cell-pathology of Virchow, however, was based upon a law he sought to establish; viz., that every cell sprang from a pre-existing cell, and that we must not transfer the seat of oval action to any point beyond the cell. This supposed law, he maintained, was opposed by so many histological facts as to be altogether untenable. He begged especially to draw attention to the origin of pus-cells, which Virchow and some of his followers had represented as originating in the interior of connective tissue corpuscles. Dr. Bennett and his pupils had frequently sought, by passing setons through the skin and muscles of animals, to observe in the inflamed tissues the appearances which had been figured in support of Virchow's views, but had never succeeded in seeing pus-cells within pre-existing cells. Henle had pointed out that the error had originated in mistaking the triangular spaces observable, on a transverse section, between the bundles of various fibrous tissues, for cells; as in these, unquestionably, pus was very likely to collect. Dr. Bennett further believed that the tendency of many cells to enlarge as the result of irritation, and to multiply themselves endogenously, as shown by himself, by Roberts, Goodsir, Redfern, and other pathologists, was another source of mistake among the younger histologists. The granules and included cells so formed were mistaken by them for those of pus, though easily separated from them. He called attention to a series of preparations (which were exhibited), showing suppuration in inflamed eyeballs, and in pneumonic lungs, in which pus-cells might be seen in all stages of formation—originating from a coagulated molecular exudation, unconnected with any pre-existing cells whatever. In the sections of lung more especially, the fibrous tissue of the organ surrounding the air-cells might be seen to be quite healthy. In the coagulated exudation, on the other hand, the molecules might be observed at first uniformly filling up the air-vesicle; then formed into masses, varying in size from the twenty-thousandth to the one-thousandth of an inch in diameter. The latter were rounded, and were identical with pus-corpuscles. He believed that these bodies, therefore, were formed by an aggregation of smaller particles or molecules, composed originally of the coagulated exudation. It was certain that, in the situations referred to, they did not originate in pre-existing cells, as no such cells could be seen. If, as might be supposed, they sprang from the epithelial cells lining the chambers of the eye or the air-vesicles, such cells would be seen, enlarged, and containing the pus-bodies. But his preparations and numerous examinations of the part when diseased had proved to him that no such cells were mixed with the exudation, or in any way connected with the formation of pus.—*British Med. Journ.*, Oct. 7, 1865.

MATERIA MEDICA AND PHARMACY.

7. *Danger of Subcutaneous Injections.*—Prof. NASSBAUM, of Munich, has just published an interesting account of an accident which happened to himself. Suffering from neuralgia, he had injected morphia under his own skin more than 2000 times—sometimes to the extent of five grains of morphia in twenty-four hours. Two months ago, he injected two grains of acetate of morphia dissolved in fifteen minims of water, and accidentally sent it direct into a subcutaneous vein instead of into the cellular tissue. He gives a graphic account of his dangerous position for two hours, after which the effect passed off. He has seen similar effects in a smaller degree in two of his patients, and the practical lessons are, that it may be impossible to avoid veins at all times, and one may be punctured unawares, subcutaneous injection should always be done *very slowly.* The effects are so instantaneous that the syringe can be stopped at the first sign of danger, and some of the injected fluid mixed with blood may even be sucked out again by the syringe. It is very remarkable how the effects of the same dose of the same substance differ when directly injected into a vein and mixed with the venous blood, and when they filter into the blood from the cellular tissue through the unbroken coats of the vessels."—*Med. Times and Gaz.*, Sept. 23, 1865.

8. *Physiological Action on Certain of the Amyl Compounds.*—Dr. B. W. RICHARDSON communicated to the British Association for the Advancement of Science at its meeting in September last, a second report on this subject. In his previous report he had studied the action of the nitrite of amyl; in the present he considered amylic alcohol, hydruret of amyl, acetate of amyl, and iodide of amyl. The hydruret is an anæsthetic, and produces symptoms akin to somnambulism. Amylic alcohol (hydrated oxide of amyl) produces, after long administration, insensibility to pain and peculiar rigors, which may be sustained many hours. Acetate of amyl exercises a similar influence; whilst iodide of amyl produces, in addition to the same symptoms, profuse secretion. Each one of the series destroys the voluntary power of the muscles, but not the vis insita; their action seems to be purely on the nervous system, and specially on the centres of motion.

The practical conclusions to which the author had arrived were three in number, but we are able only to notice them in the briefest manner, omitting the reasons on which they were based. First, he thought that none of these bodies were safe as anæsthetics; they would not replace ether and chloroform, but they, especially the iodide, might be employed in tetanus with promise of good. Secondly, the investigation taught a useful lesson in regard to the alliance of the symptoms produced with the symptoms of various diseases. It was possible that in some diseases analogous compounds were formed in the body from amylaceous matter under the influence of perverted chemical action. Thirdly, the experiments were of great moment, as indicating how the substitution of one element for another in an organic compound modifies the action of such organic substance on the body.—*Med. Times and Gaz.*, Sept. 30, 1865.

9. *Modification in Canquoin's Caustic Paste.*—This valuable caustic would be still more employed were its application not somewhat difficult; and one of M. Demarquay's pupils has contrived a modification in its composition which renders its application very easy and effectual. The paste thus formed consists of chloride of zinc ten, flour twenty, and glycerine four parts. So prepared, it can be applied to the part to be destroyed with great facility, however varied this may be in shape or direction, and can as easily be washed away. M. Demarquay has frequently employed it, and finds the paste thus prepared with glycerine instead of water far preferable, both with respect to its application and the results.—*Med. Times and Gaz.*, Dec. 2, 1865, from *Bull. de Thérap.*, Sept. 15.

10. *New Anæsthetic Mixture.*—M. BAKER BROWN, Jr., exhibited to the Obstetrical Society of London (Oct. 4) a preparation of two parts of chloroform with

one of alcohol to which the distilled essence of eau de Cologne had been added, which he had found to allay the pain of labour without complete anæsthesia, and recited cases in which it had been used.—*Med. Times & Gaz.*, Nov. 11, '65.

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

11. *The Use of the Thermometer in Acute Disease.*—In the *Lancet* (Nov. 4, 1865) we find the following interesting clinical remarks on the use of the thermometer in medical diagnosis, by Dr. SIDNEY RINGER.

"During acute inflammations of any of the tissues of the body, the temperature is always abnormally elevated, often greatly so. Not unfrequently it rises from 98° or 99° (the normal temperature in the axilla) to 103° or 105° F. The amount of elevation is proportionate to the intensity of the inflammation, and thus the temperature measures its intensity and duration. In acute Bright's disease (acute inflammation of the kidney), we have such an elevation of the temperature of the body, and thus we are able in such cases, by means of the temperature, to estimate exactly the duration and intensity of the inflammation. When the inflammation ceases the temperature becomes normal, and is not elevated by those chronic changes that follow in the kidney the acute inflammation. In many cases of acute Bright's disease, long after the temperature has become normal, and, consequently, after the inflammation has ceased, blood continues to pass with the urine from the kidneys. This continuance of the blood in the urine is very generally received as evidence of the continuance of the acute inflammation, and the patient is often cupped over the loins, and low diet given, with the hope of lowering this imaginary inflammation. But no such conclusion can be arrived at from the presence of blood in the urine; and such a conclusion sometimes misleads the medical man, and causes him to adopt a course of treatment at least useless. But such treatment has a positive injurious influence on the chronic disease. For this chronic disease following the acute is chiefly due to the previous impaired health of the patient. If this has been good, in most cases no chronic disease follows; but if the patient's health has been broken down from any cause the chronic disease is very apt to follow on the acute. Thus any treatment that will still further increase the anæmia, or otherwise lessen the nutrition of the body, is liable to produce chronic changes in the kidney or to greatly prolong their duration. Thus such treatment should be carefully avoided. It is in accordance (Dr. Ringer said) with his experience that, on the cessation of the acute stage, the passage of blood and other evidences of the chronic disease are best treated by those means and medicines that tend to promote most perfectly the nutrition of the body. Hence, as the treatments of the acute and chronic inflammation of the kidney are thus often opposed, it becomes of importance to ascertain the most valuable symptom by means of which we can learn when the acute stage has ended and the chronic begun. The temperature of the body gives us the most important information, and it is superior to all the other symptoms, as it is the only constant one. The next in value is the quantity of urine, for, generally, when the acute stage ends the quantity of urine greatly increases; but there are many exceptions to this rule, whilst in all cases, at the termination of the acute stage, the temperature becomes normal.

"The amount of anasarca is greatly determined by the amount of anæmia existing. Thus if the anæmia be marked, the anasarca is great. In many cases during the acute stage and commencement of the chronic there is no anasarca; but as the anæmia progresses, the anasarca is developed and much increased. This symptom is thus best treated by those means which promote the nutrition of the body, both by directly lessening the anæmia and by assisting to restore the kidney to its healthy state. Warm baths and purgatives during the chronic stage should be used with caution, as they easily cause great anæmia and impair the nutrition of the body. The amount of anasarca must not determine their use, but rather the amount of urine and the drowsiness of the patient. General anasarca appearing suddenly is due either to acute Bright's disease or sudden loss of a considerable amount of blood. If the latter has occurred, it can be at once ascertained. Thus in cases with sudden appearance of anasarca the diagnosis is mostly easy. It is true that cases are met with in which patients become rapidly anasarcous whose urine is quite normal; but in such cases the temperature is normal, and the anasarca has lasted several days. The acute stage, in fact, is over; for not unfrequently in cases of acute Bright's disease, immediately the temperature falls, the urine becomes healthy, the blood and albumen disappearing in the course of a few hours. The blood in the urine, after the inflammation has ceased, is not so grave a symptom as albumen—the latter being more significant of the chronic disease; the former being probably due to some capillaries remaining open and allowing blood to pass out. At least, practically it is found that blood mostly ceases shortly, and the kidney recovers quickly; whilst if the albumen be large in quantity, the kidneys are slow in recovering. Thus if the amount of albumen be not greater than can be accounted for by the blood present, the prognosis is not bad; but if the quantity of albumen be large, the prognosis is more grave, and each day it continues adds greatly to the seriousness of the prognosis. It must be recollected that the urine may be very deeply tinged with blood, and yet very little albumen be present; in other words, a small amount of blood may cause a very red colour of the urine. The duration of the acute stage, measured by the temperature of the body, is usually three to six days. Patients very rarely die during the acute stage. It is the chronic disease which follows that destroys life. Thus it is evident that it is important to determine when the acute stage has ended, that such treatment may be adopted to prevent the chronic disease. The temperature of the body affords the easiest way of ascertaining this; for though great information may be obtained from the other symptoms, such as the pulse, tongue, appetite, &c., still these are not constant; whilst, as has been already stated, the temperature is always elevated whilst the acute inflammation lasts, and becomes normal when the inflammation ceases. It is important also to bear in mind that the continuance of blood in the urine is not a proof of the continuance of the acute inflammation."

12. *Hydatids of the Liver, their Diagnosis, their Dangers, and their Treatment.*—Dr. MURCHISON read an elaborate paper on this subject before the Medical Society of London (Oct. 16, 1865). It commenced with a report of twenty cases, including all that had been the subject of post-mortem examination at the Middlesex Hospital during the last eleven years, and others that had occurred in the author's own practice. In the course of the paper also, reference was made to all the cases recorded in the Pathological Transactions and others in the medical journals. Dr. Murchison pointed out that, owing to the sudden termination of fatal cases of hydatid disease, hospital records hardly gave a fair view of the ratio of deaths from this cause. Although there could be no doubt that an hydatid cyst might become arrested in its growth, shrivel up, and undergo what is called a spontaneous cure, this result rarely happened when the tumour was large enough to be diagnosed during life. In the large majority of cases it went on increasing, and ultimately burst, and when this happened death was the usual result. Attention was directed to the remarkably latent character of hydatid tumours of the liver: in most cases they gave rise to no uneasiness until they had attained such a size as to compress adjoining organs, or until they were on the point of bursting, and peritoneal inflammation was excited on their surface. The directions in which an hydatid tumour of the liver might burst were various. 1. Into the cavity of the chest. 2. Into the peritoneum. 3. Through the abdominal parietes or lower intercostal spaces. 4. Into the stomach or intestine. 5. Into the bile-duct. 6. Into the vena cava inferior. Independently of rupture, hydatids might destroy life—1st. By compressing important organs and interfering with their functions. 2d. By suppuration of the cyst, or external to the cyst, and pyæmia. 3d. By the formation of secondary hydatid tumours in different parts of the body. It followed that the risks to

which a person with a large hydatid tumour of the liver was liable were many, and the chances of his escaping them were few. Although the tumour might remain stationary for years, an accident might at any moment cause death. Turning to treatment, little benefit could be expected from medicines. Chloride of sodium and iodide of potassium, the two most vaunted remedies, were of no use. It was difficult to conceive how chloride of sodium could destroy an hydatid, seeing that hydatid fluid always contained such a large amount of this salt, which, indeed, appeared to be essential to the life of the parasite. With regard to iodide of potassium, there was not only no proof that it could cause absorption of an hydatid, but there was positive evidence that the drug never reached the hydatid. Not a trace of iodine could be discovered in the hydatid fluid of a patient of Dr. Murchison's who had taken fifteen grains of iodide of potassium daily for several weeks before. Puncture of the cyst was of much greater promise, and had been attended with great success. The dangers were peritonitis and suppuration of the cyst, but by the employment of a fine trocar these dangers might in a great measure be avoided. The error of using a large trocar, or of making an incision with a scalpel, lay at the root of most of the accidents that had occurred. The evacuation of the fluid through a fine canula sufficed to destroy the life of the hydatid. Of twenty cases of hydatid tumour of the liver tapped as described, and collected by the author, all but three had recovered; and of the three fatal cases, death in one was due to secondary tumours, in a second to a miscarriage, and in the third case the cyst had suppurated and the patient was moribund at the time of the operation. In all cases, therefore, where an hydatid tumour of the liver was large enough to be diagnosed during life, and was increasing in size, the operation of puncture and evacuation of the cyst in the manner described was advisable. But before resorting to puncture, it was of course necessary to be certain of the nature of the tumour. The diseases most liable to be mistaken for hydatid tumours of the liver were, abscess of the liver, a distended gall-bladder, extensive effusion into the right pleura, an aneurism of the aorta or of the hepatic artery, and cancer of the liver. The points of diagnosis from these lesions were carefully considered, but the author believed that what was called "hydatid vibration" was a sign of little importance in diagnosis. In a doubtful case there could be no objection to making an exploratory puncture of the tumour. If the tumour was hydatid the fluid drawn off would at once reveal its nature, even if it contained no echinococci. Hydatid fluid was clear and colourless as water; it had a specific gravity of 1009 or 1010; and it contained not a trace of albumen, but a large quantity of chloride of sodium: these characters applied to no other fluid in the human body, whether healthy or morbid. If the tumour turned out to be cancer, or even aneurism, there was ample evidence that no harm would result from a minute puncture. The paper concluded with the details of a case under the author's care, where paracentesis had been performed with complete success. The patient at the end of a year was in perfect health.—*Lancet*, Nov. 4, 1865.

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13. *Children's Diseases.*—M. Roger, of the Hôpital des Enfants-Malades, in a clinical lecture on the Diseases of Children, remarked:—

Infantile pathology presents marked differences from the pathology of other periods of life.

1. The newly-born child and the infant at the breast have their special diseases—erysipelas of the umbilicus, scleroma, hydrocephalus; and, a little later, thymic asthma or spasm of the glottis.

2. Some affections, which are rare in adults, are so common in children as to be regarded as peculiar to the first period of existence; for example, convulsions and spasms, hooping-cough, croup, rickets, scrofula, and worms.

3. Then, again, certain diseases which are common at all ages, have a special character in the young. Thus, in them we meet with lobular instead of lobar pneumonia; with tubercles generally distributed, instead of localized in the lungs; and with bronchial phthisis, tubercular meningitis, etc.

4. The phenomenal expression of diseases, again, is distinct. The slightest affection in the child may be ushered in with apparently the most serious symp-

toms. In consequence of the child's highly impressionable nervous system, any inflammation may be attended with spasms, and thus simple laryngitis takes a stridulous or croupy form. Fevers may be attended with convulsions, and any disease may begin with vomiting. The accidents attending dentition, follicular enteritis, or infantile cholera, frequently coexist with the cerebral type.

5. The diseases of children, on the other hand, are, like those of old age, often latent. In old age, we often find irreparable damage done by disease before its existence is manifested; so likewise do we see tubercular meningitis often begin with trifling ailment. Affections of the heart may increase from day to day, and yet scarcely disturb its function. How often have we had occasion to note the *bruit* characteristic of incurable endocarditis in children who present the appearance of most perfect health. Eruptive fevers and other diseases often appear without any marked prodromata. We have often found, at the autopsy, an extensive empyema, or hepatization of a lung, in cases in which no symptoms of these affections appeared during life.

Hence, then, there are special difficulties to be met in the diagnosis of infantile diseases. But these difficulties have been exaggerated. We must not, as some would have us, look at infantile pathology as a mass of medical enigmas, of which specialists alone possess the key.

More than this, I maintain that there are some cases in which the diagnosis is easier in children than in adults. Thus, for example, suppose hemiplegia suddenly to appear in a child, what is the cause? Cerebral hemorrhage? Very probably not; for apoplexy, common in old age, is exceptional in childhood. Is it softening of the brain? No; for softening of the brain, also a disease of old age, is in the child almost symptomatic of cerebral tumour. Syphilitic exostosis, again? No; for tertiary syphilis is unknown in infancy. And cancerous tumours are most rare. But there is a morbid product which is very common in early life, and frequently developed in the nervous system of the young; and that is tubercle. Other examples might be given to show that in the child the elements of the pathological problem are often more simple and easy of solution than in the adult and in old age.

The progress of infantile diseases is often rapid. In a few hours, fatal changes may be effected. The little patient, therefore, should be frequently visited. Dr. West recommends that, in the practice in large towns, three or four visits a day should be made, and even more. For the most serious cases, the advice is good; and, as for others, the position, critical or other of the patient, must be considered, and also the purse of our clients. Too many visits are, however, better than too few, both for the patient's sake and your own. Your reserve or delicacy in this particular may be regarded as neglect, if the patient die; whilst, if he recovers, the excess of your visits may be set down to devotion to your duties. This last piece of advice is, believe me, founded on practical experience.

Certain qualities are required in the child's doctor. He should be sagacious, quick of judgment, patient, and gentle. He should have the art of approaching and addressing children, of using their language, and entering their play. He should be fond of children; and, if he has any of his own, he will more quickly find his way to the hearts of mothers. He should, as was said of Guersant, and as might be said of M. Blache, have a maternal heart. The physician should always possess the sentiment of compassion for his little patients, so well expressed by Rousseau. "Is there a being in the world more feeble, more wretched, more at the mercy of others, which more demands our pity, than an infant?" The diseases of infancy should appeal to the heart as well as to the skill of the physician.—*Brit. Med. Journ.*, Sept. 23, 1865.

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14. *Aphthæ of the Mouth and Throat, with Sickness and Diarrhœa in Adults.*—Dr. WILKS states that he has seen during the last few months several cases of this kind which were so alike in their general features as to be deserving of a special position by themselves. He furnishes the following notes of some of his cases:—

One of the earliest and most severe cases which I witnessed was that of a young man in consultation with Dr. Waterworth, of New Kent-road. I found the patient sitting up in bed dreadfully ill, making ineffectual attempts either to hawk up tenacious secretion from his throat or to swallow it. It was evident that his great trouble was in his throat; this was with difficulty examined, as its extreme irritability produced a constant dread of vomiting. The whole mucous membrane was of a deep red color, covered with white specks, patches, and tenacious mucus; indeed, it was in a state which might be called follicular stomatitis, or even thrush—using the term in its most general sense. There was also considerable extension of the malady down the bronchial tubes, as evidenced by the râles and the tenacious expectoration. He had already got much thinner, and his pulse was very rapid and feeble. He had constant sickness and diarrhœa. It should be said also that the secretion from the mouth was very fetid. If an examination of the throat had not shown an absence of false membrane, the case in other respects might have been regarded as one of diphtheria, judging from the extreme illness of the patient. Supporting remedies were evidently indicated, but they were taken with much trouble. He remained very ill for about two weeks, and then gradually recovered, but has scarcely regained his strength at the present time.

Another case was the daughter of a surgical instrument maker living at Lewisham. She was suddenly taken ill with severe febrile symptoms, and soon became affected with a very bad mouth and throat resembling the aphthous condition seen in children. She also had constant sickness and frequent diarrhœa; the skin was hot, and the pulse very quick and thready. After a few days the urgent symptoms passed off, but great prostration remained for a long time, and the disposition to sickness and diarrhœa continued for some weeks. She is now in a very precarious state.

A third case, somewhat resembling these, I saw with Dr. Butler, of Woolwich; the onset of the case was marked by delirium; but here the bronchitis was more severe, and the patient died in a very few days.

Another fatal case, with similar symptoms, I attended at Camberwell, with Mr. Lacey, but here the young man had been very dissipated, and had much mental depression, so that his previous condition may have had much to do with the result. The matter expectorated in this case was so offensive that the house was scarcely bearable, and suggested gangrene of the lungs, but of this there were no physical signs.

A lady at Croydon, after having a severe illness of a similar character to those mentioned above, suffered some time with stomatitis and bronchitis, and then gradually recovered.

I have within the last few days seen a sixth case at Rotherhithe for the second time. A young woman was taken suddenly ill with rigors, and in a few days was in an extremely critical condition. She had the same follicular stomatitis as in the other cases, the mucous membrane being of a deep red colour, and covered with white spots and patches of secretion. It was so painful that she could scarcely swallow; at the same time there was very frequent vomiting and much diarrhœa. After being very depressed for some days, and giving her friends and the medical man much anxiety about the result, she slowly began to improve.

If one had witnessed but a single instance of this kind, the disease might have been attributed to some special exciting or individual causes; but when half-a-dozen cases of a malady come before the same practitioner, and present the same symptoms, he cannot but regard them as examples of a particular type of disease. I believe, therefore, that I am witnessing a malady which cannot be referred to any one name in the category of disease. It has points of affinity with diphtheria; and, indeed, if the latter term can be used in a larger sense than that which implies the presence of a membrane, it is possible that very similar causes may be in operation for the production of the two diseases. I have used, as a conventional expression, the term "gastro-enterite" on the supposition that the whole mucous membrane of the alimentary canal was in a state of morbid action. This French expression I have never before adopted except in the case of children, in whom it is a convenient one; and, in speaking of children, I think I cannot better explain the form of malady to which I wish to draw attention than by saying it almost exactly resembles that which medical men are in the habit of witnessing in infants, but transferred to adults. I refer to the very common cases of infants who from error in diet or unknown causes, rapidly fall away in flesh, have vomiting, purging, and an aphthous state of mouth. In such cases, the nurse's opinion that the thrush has gone "through them" is not altogether erroneous, for I have seen the stomach and intestines show evident signs of morbid action, and the œsophagus covered with an adherent white secretion like that of the mouth, and corresponding very closely to a plate given in Cruveilhier's "Morbid Anatomy" under the head of "Muguet."—*Med. Times & Gaz.*, Sept. 2, 1865.

15. *Malignant Pustule.*—At the meeting of the Academy of Sciences on June 19th. M. Cl. Bernard presented a paper by M. DAVAINE on the nature of the malignant pustule. The object of the author was to bring forward additional proof of the identity of the disease with the *charbon* of animals, as shown by the presence in both of the filiform organisms called by him *bacteridia.* In September, 1864, he, in conjunction with M. Raimbert, communicated to the Academy a case of malignant pustule in which bacteridia were present; and he now had some additional instances to adduce. Two pustules, removed on the second or third day of their development,[1] were immediately placed in a solution of chromic acid, and thus hardened. On placing very thin sections in a solution of caustic potash, the cutaneous elements were removed while the bacteridia were left. In both instances, these organisms were located in the rete mucosum, underneath the superficial layer of epithelium; they were arranged in groups, separated by collections of normal epithelial cells, with which the masses of bacteridia at their outer part became gradually blended. No other pathological element was discovered in the pustules.

Malignant pustule, M. Davaine observes, is a disease primarily of local origin, and may within the first two or three days, be arrested by removal and by cauterization: but, if this be not done, the constitution becomes affected. This succession of phenomena is explained by the anatomical constitution of the pustule. At first the bacteridia, developed in the non-vascular epidermic tissue, are isolated and may be destroyed; but, if left, they soon reach the true skin, from which they are carried into the circulation by the lymphatics and blood-vessels. In support of this view, M. Davaine relates the case of a man who was admitted into the Hôtel Dieu under M. Grisolle. On June 3d, he perceived a malignant pustule on his neck; and on the 6th he died, in spite of the application of corrosive sublimate and the actual cautery. On *post-mortem* examination, made on June 8th, there was observed: cadaveric rigidity; absence of putrefaction or gangrene; œdema of the subcutaneous cellular tissue of the chest, extending to the mediastina; partial congestion and sanguineous effusion at the apex of the left lung; sanguineous engorgement of the liver: enlargement and softening of the spleen; and black, fluid, diffluent blood in the heart and large vessels. The blood in the heart contained a large number of bacteridia. M. Davaine inoculated a guinea-pig with a drop of this blood: in two days the animal died, and its blood was found to contain an immense number of bacteridia.—*Brit. Med. Journ.*, Sept. 9, 1865, from *Gaz. Méd. de Paris,* July 1, 1865.

16. *Animal Parasite Diseases of the Skin.*—Dr. BALMANNO SQUIRE, in a communication made to the British Medical Association, states that the diseases produced by epizoa "are not only of extremely common occurrence, but are some of them most obstinate. That they are so prevalent, is doubtless owing to their contagiousness; and their character for obstinacy is due solely to their cause, in the majority of instances, having been hitherto unknown.

"Many cases of urticaria, more especially of chronic urticaria, of eczema, of prurigo, of lichen, and of impetigo, or rather of diseases that pass by these names, are as distinct in their etiology and pathology, as well as in the treatment that they require, from cases of these affections properly so-called, as they well can be; since, in place of being of constitutional origin, they depend essentially on the presence of an animal parasite on the skin.

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[1] Dr. Mauvezin, says M. Devaine, has in many instances obtained successful results by removing the pustules and cauterizing the wound.

"Often an acute eruption, having apparently all the characters of urticaria, after having been steadily and perseveringly treated as if it were dependent on gastro-intestinal disorder, is found to remain unchanged, or to have become worse, rather than better. No disease is looked on as more hopeless than chronic urticaria; and prurigo senilis has ever been an *opprobrium medicinæ*. These last two diseases, indeed, well deserve the serious attention of all who are engaged in the practice of medicine. They are certainly common enough to render it most desirable that their origin and nature should be generally understood; and they are at least severe enough, both as regards the degree of distress they occasion and the length of time over which their course usually extends, to make it advisable that some more efficient means should be employed for their relief than what are generally thought to be the appropriate remedies for them.

"Many of the most intractable cases of eczema and of impetigo of the scalp—intractable only so long as they are treated on the assumption of their being of constitutional origin—might readily and speedily be got rid of; and many ingenious theories that have been broached on the subject of contagious impetigo might be dispensed with, if the influence exercised by animal parasites in the causation of these diseases were properly appreciated. Many obstinate cases of lichen, too, if separated in like manner from the category of constitutional affections, would be found much more amenable to treatment than they are generally thought to be.

"The limits of a short paper precluding any detail on the etiology, diagnosis, and treatment of this important class of cutaneous diseases, Mr. Squire would only here point out their claims to a more attentive consideration than they have yet received, and mention some of the results at which he had arrived.

"Cases of acute urticaria are sometimes occasioned solely by the presence of the *acarus scabiei* in the epidermis. The author was not aware that this fact had as yet attracted the attention of other observers. He referred to cases where the skin of the person affected, instead of presenting the ordinary appearances of scabies, was covered with a copious eruption of urticaria—apparently, at first sight, the only phenomenon present. There were no signs of gastro-intestinal disturbance; no history either of any previous attack, or of any of the ordinary causes of urticaria having been present. On searching, in these cases, for some other cause, the acarus was discovered, and the condition of the acarian furrows corresponded to the duration of the eruption.

"He had also seen cases of urticaria in which the cause of the eruption had been set down to gastro-intestinal disturbance, but which, as a more careful examination proved, were really produced by the *pulex penetrans*.

"In many cases of scabies, too, he had known a copious eruption of eczema to form so prominent a symptom, that the patient has been treated without success, for chronic eczema; whereas, if its origin had been rightly apprehended, the affection need never have been prolonged sufficiently to entitle it to the name of chronic.

"A large proportion of the cases of eczema and of impetigo of the scalp, that occur in private as well as in public practice, are, the author had had occasion to notice, due to the *pediculus capitis*. At least, this parasite is often present; and, as soon as it is destroyed, the disease ceases, without the employment of any further means.

"Many cases of lichen—affecting the temples and the upper part of the back of the neck—he had found to be due to the same cause.

"The great majority of the cases of chronic urticaria that he had met with, and all cases that he had yet investigated (amounting to a large number) of prurigo senilis, were due to the *pediculus corporis*. The 'prurigo senilis' was not restricted to old persons, though more common with them than with the middle-aged or young: for Mr. Squire had seen it in a child of four years old. Nor did he include under the title the various forms of circumscribed prurigo occurring in old persons, and regarded generally as equally hopeless with prurigo senilis commonly so-called.

"These local varieties of prurigo, though in many cases the result of a lichenous or eczematous affection happening in the localities, are in the majority of cases merely sympathetic with, and symptomatic of, visceral derangement. Thus, if a careful inquiry be instituted, prurigo podicis will be found to depend on hæmorrhoids, prolapsus ani, fistula or fissure of the rectum, on accumulation of feces in the sigmoid flexure, dysentery, intestinal worms, or the presence of some other irritating cause in some portion of the intestine. Prurigo pudendi muliebris—a no less distressing and inveterate affection—is similarly symptomatic of some abnormal condition of the vagina or uterus; while prurigo scroti is occasioned either by psoriasis or eczema of the part in the great majority of instances."—*Brit. Med. Journ.*, Sept. 2, 1865.

17. *Degeneracy of Vaccine Lymph by Frequent Transmission.*—On this subject the most contradictory opinions have been expressed. Mr. T. M. HARDING has fairly discussed the question in an article in the *Medical Times and Gazette* (Sept. 23, 1865).

He shows that the constitutional manifestions produced by vaccination, either direct from the cow or after a few transmissions as described by the early vaccinators, were much more severe than are observed at the present day from vaccine matter now employed. Hence he thinks it "a fair conclusion that the constitutional symptoms produced by inoculation with matter derived directly from the cow or from persons who have casually derived the disease from the cow are much severer than those produced by the current lymph of the present day."

Mr. H. then inquires whether the protective efficacy of vaccination has diminished?

He states that when vaccination was first introduced by Jenner, that, to demonstrate its efficacy, the vaccinated were exposed to smallpox infection and inoculated with variolous matter, without taking the latter disease. He observes: "If it had been possible in the first few years after 1798 to find one fatal case of smallpox after vaccination, would the operation ever have made way with the public? Yet now it would be easy to find not one, or ten, or a hundred, but thousands of deaths after vaccination. What explanation more rational or more probable can be offered, than that the vaccine virus has undergone some change during its repeated transmissions that has in some way diminished its power, especially when we consider that the local manifestations and constitutional symptoms are also modified, and, in fact, diminished? There is another reason why we should have expected *à priori* that this would occur. Inoculation of smallpox itself is known to be followed by a gradual diminution of intensity, so that in time the matter is no longer capable of producing the disease."

Mr. H. advocates a renewal of the lymph. "I do not recommend," he says, "the general and indiscriminate employment of primary lymph; its effects upon some constitutions are too violent, it requires to be passed through some constitutions properly selected by competent judges before it acquires sufficient mildness to be appropriated for general use. I think that many repeated renewals of lymph could be effected in this way, so as in a short time to completely supersede the lymph now employed, and such a recourse to the parent stock for renewal of lymph may be had periodically, so as to maintain the action of the lymph to the standard of Dr. Jenner. Such a course would materially improve the condition of the people of this kingdom, so far as their immunity from smallpox is concerned; but, after all the care, cases of post-vaccinal smallpox will occur. Let it be remembered, then, that vaccination does not confer an absolute, but a relative, immunity from smallpox, and the more complete the vaccination—that is, as regards the purity and strength of the virus and the number of punctures—the more complete the immunity."

18. *Assimilation of Fat in Consumption.*—Dr. HORACE DOBELL, in his "third report of cases treated with Pancreatic Emulsion" (*Lancet*, Nov. 11 and 18, 1865), offers the following explanation of the frequent failure of our attempts to keep up that favourable change which so often occurs in consumptive cases when cod-liver oil is first administered:—

"We all know how constantly it happens that a consumptive patient makes remarkable progress for a certain time while taking cod-liver oil, if it is well digested—a progress which might well lead us to hope that it would end in a cure; and we all know equally well how constantly this progress stops at a certain point, beyond which the recovery does not seem able to advance, and from which it too often happens that, sooner or later, a gradual descent takes place. The suggestion I wish to make is, that, assuming a defect to exist in the natural power of digesting and assimilating fats, it would be irrational to expect anything else to happen than that which we witness.

"According to the careful estimate of Dr. Lyon Playfair,[1] the quantity of fat required by an adult in twenty-four hours, to keep up healthy nutrition, is from 1 oz. to 2.5 oz.; and according to the estimate made from very numerous and carefully selected data by Mr. Farrants and myself,[2] the quantity is from 2 oz. to 3.5 oz. We may fairly assume, then, that not less than two ounces of fat per day, on an average, is required to keep up healthy nutrition in an adult. We have next to bear in mind, that before a case of consumption ordinarily attracts attention, and begins to be treated as such, many pounds weight, principally consisting of fat, have been gradually removed from the body. In this condition—1, a deficiency of fat through the organism; 2, a loss of the power to assimilate ordinary fats; 3, a constant demand for two ounces per day, to maintain healthy nutrition—we administer cod-liver oil, in the belief that this form of fat will assimilate when other forms will not. Supposing that it agrees, and that some or all of it is utilized, a rapid improvement takes place in the patient, from the supply of some of that for want of which life was steadily fading—very much as a cut flower that has drooped for want of its supply of sap rallies and recovers freshness for a time when put into water. But there are very few persons who can take more than from half an ounce to one ounce of oil per day—few who can even take this steadily from week to week without intermissions. But supposing an ounce or an ounce and a half per day to be taken regularly, how is this to supply, not only the two ounces per day required for healthy nutrition, but all the extra ounces of arrears that were lost before the treatment was begun? But assuming the possibility of two ounces per day of oil for nutrition, and another two ounces for arrears, being taken and utilized, even then the whole thing may be unstable and may break down, from the fact that we are supplying oil and not solid fat—a body rich in olein and poor in stearin and margarin, in the place of bodies rich in stearin and margarin and poor in olein, such as the fats taken in normal food.

"The practical conclusion from these considerations appears to be, that if we are to give a fair chance of recovery to a patient deprived of the natural powers of digesting and assimilating fats, we must, by one means or another, secure that two ounces of fat of average solidity are utilized every day for the purposes of nutrition, and an additional ounce or two to make up for arrears.

"To obtain this end four principal means are now at our command:—

"1st. The administration of as much oil and fat, either as medicine or food, as the digestive and assimilative powers are still competent to utilize.

"2d. The introduction of fat and oil into the system by rubbing them into the skin of the body and limbs.

"3d. The supply of saccharine and amylaceous articles of food in sufficient quantity to insure that no call shall be made upon the hydro-carbons for elements which can be as well supplied by the carbo-hydrates.

"4th. The introduction of pancreatine and pancreatic emulsions in sufficient quantity to enable the digestive and assimilative organs to utilize the necessary amount of fat."

19. *Inhalation of Oxygen in Phthisis and Anœmia.*—Dr. J. R. Wolff states that Prof. Trousseau, who has experimented largely for the last three years with the inhalation of oxygen, informs me that he found it of no service in any of the stages of tuberculosis; on the contrary, it appears to act as an irritant

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[1] The Food of Man in Relation to his Useful Work. 1865.

[2] A Manual of Diet and Regimen. 1864.

in that affection. On the other hand, he found it an invaluable modificator in anæmia, the consequence of excessive uterine hemorrhage, fatigue, protracted bodily and mental suffering, bad alimentation, and nursing—in that anæmic cachexia which cuts off the patient by hectic fever in spite of all treatment. "Many a time," says the eminent Professor of the Hôtel-Dieu, "I had to sigh under a sense of incapacity in dealing with these cases. I have vainly sought for a remedy against them, and I owe it to the labours of my friend and colleague M. Demarquay that I have in many cases been able to recall to life patients whom I have considered as past all help."[1] The remedy consists in making the patient inhale pure oxygen from a caoutchouc apparatus made for the purpose. The quantity inhaled is about six or ten quarts per day. As an illustration, he gives the history of a patient whose appearance was cadaveric, with a pulse from 120 to 130, dry skin, anorexia, who could not sit up for a moment without falling into syncope, but who was cured by the inhalation of oxygen, after iron and tonics had failed.[2] The remarkable feature of that remedy is, that every inspiration of the gas produces in the chest a feeling of agreeable freshness, and the pulse falls eight beats after two or three inhalations, the appetite is revived, and digestion is facilitated.—*Med. Times and Gaz.*, Nov. 25, 1865.

20. *Use of Phenic Acid for the Cure of Phthisis.*—Dr. WOLFF, in an article in the *Med. Times and Gaz.* (Nov. 25, 1865), observes: "Some two years ago the eminent physiologist, Prof. Longet, who had an attack of hæmoptysis with tuberculosis, made some experiments upon himself with phenic (carbolic) acid, by which he was greatly benefited. It is owing to the favourable report of that distinguished patient that this substance is now largely employed by some of the French physicians. Dr. Labori, of the Convalescent Hospital (L'Asile Impériale de Vincennes), has told me that he administered it to between 200 and 300 patients in different stages of phthisis, with most favourable results. The mode of administration is as follows: fifteen drops of the pure acid are dissolved in ʒij of spirits, and the solution mixed with ℥xxxij of water. This quantity is administered daily, partly by the stomach and partly by the inhalation of the fluid in a pulverized state."

For the administration of this fluid in a pulverized state, the Néphogène constructed by Mathieu, of Paris, a more simple instrument made by Lüer, of Paris, or that by Messrs. Weiss & Krohne, of London, may be employed.

21. *Instantaneous Cure of Coryza.*—An Army Surgeon, M. LUC, seized with very bad coryza, attended by fever, severe cephalalgia, and excessive secretion, determined upon trying the effect of inhalation of iodine vapour. The coryza first appeared at 9 A. M., and the inhalations were commenced at 3 P. M., being repeated every three minutes during an hour, each lasting about a minute. The headache was first relieved, the sneezing then occurring seldomer, the amount of secretion diminishing, and by 6 P. M. all traces of the coryza had disappeared, except a little burning sensation in the throat. Several of the officers have since tried the means with the same results. The inhalation is effected by placing a bottle of tincture under the nose, the hand supplying warmth enough to vaporize the iodine.—*Med. Times & Gaz.*, Nov. 11, 1865.

22. *Bronzing of the Skin for Seven Years—Disease of Supra-renal Capsules.*—A case of this is recorded in the *Medical Times and Gazette* (Oct. 21, 1865) which is particularly interesting from the long duration of the disease. It was confidently predicted before the autopsy that a certain diseased state of the capsules would be found. Whatever relation there may be between the bronzing of the skin, or rather the disease of which this bronzing is the most striking feature, and the disease of the capsules, it is a fact that they are very generally associated.

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[1] "Clinique Médicale de l'Hotel Dieu de Paris," vol. iii. p. 63.

[2] Ibid.

23. *Climacteric Insanity in the Male.*—Dr. Francis Skae gives (*Edinburgh Medical Journal*, September, 1865) the following conclusions as the result of his investigations on this subject:—

"1. That there occurs in men between the ages of 48 and 60 a form of insanity, accompanied by more or less constitutional disturbances, which, in its symptoms, progress, and results, is identical with the insanity met with at the climacteric period in the female, and which may therefore with propriety be called climacteric insanity in the male.

"2. That the symptoms of this form of insanity are so characteristic as to render it easily recognizable.

"3. That this is the most curable form of insanity associated with melancholia which occurs in men, the recoveries being in the ratio of 56.7 per cent.

"4. That the duration of the insanity in curable cases rarely exceeds four months.

"5. That this form of insanity, apart from suicide or organic disease, rarely tends to a fatal termination.

"6. That the most important indications of treatment are—early removal from associations and friends; careful watching; occupation, as especially out-of-door work; nutritious diet; and the judicious administration of narcotics."

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

24. *Osteo-myelitis.*—Dr. J. Fayrer, Prof. of Surgery in the Medical College, Calcutta, makes (*Indian Annals*, Jan. 1865) some interesting remarks on this affection, which has been the subject of several very important original papers in this Journal from some of our army surgeons.

Dr. F. says that he has not been able to satisfy himself thoroughly as to the cause of this affection. For a long time he was disposed to attribute it to the bad sanitary condition of the Indian hospitals. "I am now persuaded that although unfavourable conditions of this character increase the liability, and may, in some instances, determine the occurrence of a disease, which under more favourable circumstances would be absent, yet that these alone are not sufficient to account for a condition which makes its appearance when other cases are doing well, and when other parts of the same wound are perfectly healthy and undergoing vigorous repair. It is not at all unusual to see an amputation in which part of the bone has perished, whilst the soft parts of the stump are healthy, and whilst other surgical cases in the same ward are doing well; the aspect of the cases, generally, in hospital also being favourable.

"Much has been written on the after-conditions and unfavourable results of amputations. Necrosis of the end of the bone, retraction of the soft parts, sloughing, hemorrhage, and other untoward events are fully described; but none of these have I found to be of half so much importance, or to give rise to so much anxiety and so many failures, as the disease which I wish to describe. With reference to the mode of amputating, as a possible cause, I feel satisfied that the disease is not attributable to careless or imperfect division of the periosteum before the bone is sawn across, for I am particularly careful in all cases to divide the periosteum thoroughly with a knife, before applying the saw, in order to avoid fraying, or stripping it from the end of the bone.

"I do not say that this peculiar affection of the bone has been overlooked, but it does not appear to have attracted so much attention as it merits: the short notice it receives in most surgical works, and its absence from the Indian medical periodicals, would indicate that it has not generally been found a common affection.

"In calling attention to what I regard as a very dangerous and not unfrequent pathological result of amputations, I would especially dwell upon one important point, the question of re-amputation, at an early period, above the next joint, before the bone above the affected one, or the constitution itself, have suffered from septic contamination, and ere the lungs or other internal organs have become the seat of changes which are the almost certain precursors of death.

"Again, in compound fractures I would urge the importance of closely examining and removing any portions of bone that have sustained serious injury to the periosteum or medulla by contact with the ground or other hard substance. It is of course impossible here to indicate the exact extent of injury that should determine the removal of such a portion of bone; but in general terms it may be said that injury to the periosteum, such as causes denudation of the bone, crushing, or comminution of its cancellated texture, being likely to give rise to inflammation therein, may render it more expedient to remove a portion of the bone than to retain it within the wound. I have no wish to advocate unnecessary removal of bone; but speak of a special condition under peculiar local or endemic disadvantages. I am satisfied that osteo-myelitis is liable to follow such accidents insidiously, and am equally satisfied that it is better to anticipate the evil and (with the injured portion of bone) remove the danger.

"The same principles apply with equal force in amputation where symptoms of medullary suppuration make their appearance. In such a case the sooner re-amputation is had recourse to the greater the prospect of saving the patient's life. A nice point for consideration will be the chances of arrest of the mischief and extrusion of the dead portion, as happens in ordinary cases of necrosis and exfoliation. But here it is to be borne in mind that the dangers of systemic poisoning are greater, under the most favourable circumstances, in suppuration and exfoliation of a portion of the interior and medulla of a bone, than in necrosis and exfoliation from the exterior. Risk of life is not to be pushed too far in attempting to save a portion of bone, or even a limb. I would not lay undue stress upon the importance or danger of simple necrosis of a portion of the end of the bone in a stump, even though the inner part of the bone be the part affected; for this takes place frequently enough, and though a serious cause of delay in the healing of the stump, it is not, when limited, necessarily attended with danger to life.

"It is of the diffused suppuration extending from the cut end, up the shaft of the bone in the medulla, infiltrating that tissue with pus and causing death of the inner portion of the bone; in youth up to the epiphysis, later in life, to the very head of the bone itself, with the great attendant dangers of fatal pyæmia, that I urge the importance. It is a notorious fact that purulent infection—pyæmia, septicæmia, or whatever it may be called, is most prone to occur as a result of injuries of bones, and I believe that there is no condition so certain to induce it as osteo-myelitis, or suppuration of the medulla.

"It is, therefore, to be most carefully watched for, and I cannot agree with those authorities, who regard it as difficult of detection, especially after an amputation. Upon the earliest appearance of the symptoms which indicate its advent the bone ought to be at once examined, the medulla should be most carefully looked into. This, like the cortical part of the bone, may perish in part, a line of demarcation may be set up, and the dead portion be thrown off as an entire ring of bone of an irregular shape; but as far as my experience here informs me the tendency to limitation of suppuration in the medulla is very small, whilst extension is most frequent; this, in young persons, may be arrested at the epiphysis, but even there it has a tendency to extend, and later in life the whole bone is liable to be affected, and, if left in contact with the next bone in the articulation, to extend to it also.

"The earliest symptoms of systemic infection should, therefore, be watched for, and when detected the sooner the affected bone is removed the better; and as the most effective mode of doing this is to amputate at, or above the next joint, formidable though the operation may be, it is right I believe to do nothing less.

"I am convinced that I have saved some lives by this treatment, and though it needs firm reliance on the principles on which that treatment is founded to justify one in amputating above the joint when apparently amputation through the shaft of the bone is feasible, and when the patient is suffering from the irritation of incipient blood poisoning, with the pulse at 140, and with evidence of mischief already developed in the lungs, yet I should feel that in doing so I was substituting a chance of life for a certainty of death, and without hesitation I would give the patient that chance.

"I need hardly say that the operation must not be too long postponed, or it will be too late to save the patient from the effects of blood contamination.

"The proper time for amputation in cases of diffused osteo-myelitis is not difficult to determine. It should be as soon as possible after you have ascertained that the bone is affected; and the mode of arriving at this knowledge is simply the passage of a long probe down the medulla.

"Should it impinge on healthy and bleeding medulla near the surface, you may, if the constitutional symptoms permit, wait and see if nature is about to limit the suppuration and throw off the diseased bone. Such expectations are, in my experience, rarely realized, and the doubt is generally resolved, not in favour of the bone.

"However, this is one of the nice points of discrimination in the treatment, and for which no absolute rules can be laid down. The constitutional signs, the state of the pulse, respiration and temperature, would be important indications of the state of the disease: and they cannot be too carefully studied; a pulse over 120, persistent temperature above 104; bronchial râles, hurried breathing, tenderness over the hypochondria, are symptoms that give rise to serious anxiety on their first appearance, and very speedily decide the fate, if not of the patient, of his limb."

25. *Treatment of Hereditary Syphilis without Mercury.*—In a paper by Mr. R. W. Dunn read before the Royal Medical and Chirurgical Society (Nov. 14, 1865) the author first narrated the particulars of some cases of hereditary syphilis which had come under his observation at the Farringdon Dispensary, and which he had successfully treated with chlorate of potash, without using mercury in any form whatever. Out of fifty cases which he had thus treated, he had met with only one case of relapse, which readily yielded to a repetition of the same treatment; and three deaths, one child dying of convulsions, and the other two being in a dying state when first seen by him. The author then entered upon the general treatment of syphilis, briefly alluding to, and giving the names of, those who have advocated the non-mercurial treatment. On the authority of the *British and Foreign Medico-Chirurgical Review*, he stated that from 1800 to 1835 about 80,000 cases of syphilis had been treated without mercury. He rejoiced in the belief that non-mercurial treatment was gaining ground amongst the profession; and owing to having been so often disappointed himself in the results of specific treatment, he had now abandoned completely the use of mercury in any form in the general treatment of syphilis. In the treatment of hereditary syphilis, he considered that we must be guided by the same general rules which we observe in treating other diseases. All remedies of a depressing or lowering character ought to be avoided; and, on the other hand, tonics, cod-liver oil, strict diet, and extreme cleanliness, were essential to successful treatment. He bore evidence to the marvellous effects upon children of chlorate of potash in combination with hydrochloric acid in this disease. Where the skin was very irritable, he recommended a bran bath, the bowels to be carefully regulated, and the child to be out in the pure air as much as possible. Sixty-three days was the longest period any child had been under his treatment, and eighteen days the shortest, the average time being about thirty days.

Mr. Henry Lee said that if the experience of other practitioners confirmed the results mentioned by Mr. Dunn, it would leave nothing to be desired with regard to the treatment of syphilis. Unfortunately, however, such was not the case. Out of the number of instances that Mr. Dunn had referred to, a relapse was recorded in one case only; and the death-rate of infantile syphilis was as low as 6 per cent. These results proved too much. They were altogether at variance with the experience of those who treated this disease either with or without mercury. Thus, for instance, we are informed in Professor Boeck's published work that out of forty-two children treated by him without mercury, twenty-two died; and these cases were independent of those who died without undergoing the process of treatment recommended by Dr. Boeck. Some rational explanation must, therefore, be sought for the great difference observed in Mr. Dunn's cases, and where the history of the patients could be traced for a longer period; and this he (Mr. Lee) believed would be found in the fact that in dispensary practice, when mothers found their children not progressing satisfactorily, they took them elsewhere, and in cases of relapse after treatment they would naturally feel inclined to try some other remedy. If the cases thus abstracted from observation were recorded as cures, it would be the means of affording very favourable statistical returns under any mode of treatment. With regard to the treatment of syphilis generally, it constantly happened to him (Mr. Lee) to have patients who presented themselves after four or five years of non-mercurial treatment still uncured, and regretting that they had lost so much time in fruitless attempts to obtain relief; and he also not unfrequently saw some very severe secondary symptoms after the non-mercurial plan of treatment. Indeed, some of the worst cases of secondary sloughing of the throat and of disease of the bones which he had seen occurred amongst those in which no mercury had been used. He therefore thought that, although mercury might be injudiciously given and might then produce injurious effects, the ill-consequences attributed to it in reality very often indeed depended upon other causes. We had now the means of administering this remedy without making any serious demand upon the constitutional powers; and when thus administered, with proper care, it was a most valuable remedy, and certainly not followed by the symptoms which had been attributed to it. The author of the paper had alluded to the effect of the mother's milk upon a child. Now he (Mr. Lee) did not believe that any poisonous influence could be conveyed in this way. The health of the mother might be impaired by syphilis, and the milk would become poor in consequence, and the child might be ill-nourished; but this was quite a different thing from the transmission of the syphilitic poison by the milk. It was a law with regard to syphilis, that a person having that disease could with great difficulty, under any circumstances, be again infected. The child of a syphilitic mother would in all probability be itself syphilitic, and it would then be very difficult to conceive that any fresh poison could be conveyed to it. But we had proof that even a healthy child would not be affected in this way. The following case had come under his (Mr. Lee's) observation in St. George's Hospital. The patient was admitted during the summer of last year. She had had two healthy children, the youngest eight months old. She and her husband had been healthy. After her last confinement she took another child to nurse. This child proved to be syphilitic, and died three weeks before the patient's admission into the hospital. Shortly after taking this child to nurse she noticed a sore on the right nipple, which became very hard all round. Six weeks before her admission, this patient had an eruption, presenting all the characters of syphilis, over the body, and her throat became ulcerated. During these six weeks she continued to suckle her own child as she had previously done. She, however, always kept her own child to the left breast, and the other child to the right one. Her child remained perfectly well during the time she continued in the hospital, and was known to have been so in the November following. This patient had recently been confined again, and was attended from St. George's Hospital; and he (Mr. Lee) had reason to believe that the child which she suckled in the summer of 1864 remained healthy at the present time.

Dr. **Drysdale** said he was sorry that the respected Professor Boeck was absent, for he would doubtless have been able to have answered Mr. Lee's question In his absence, he (Dr. Drysdale) would endeavour to give an answer. It must be remembered that the cases mentioned by the professor in his work included many infants of but a day or two old. Now, in his own experience, such cases were almost uniformly fatal; children who were much affected by this complaint at birth were often too feeble to breathe. The cases brought forward by Mr. Dunn were not in this category. Infants were not brought to the hospital by their mothers until they were three or four weeks old, and all of the cases cited by Mr. Dunn were of that age. It was a great, and he thought, a rather prevalent error to imagine that all syphilitic children were emaciated and cachectic; many of them were plump and well nourished, and the "old man" look was rather the exception than the rule. There was, then, nothing surprising in Mr. Dunn's success, with the care he had taken with the cases, many of which he (Dr. Drysdale) had seen. The wonder was that these cases should so long have been considered to require a dangerous drug like mercury. He himself, he believed, had been the first to publish a case of infantile syphilis treated without mercury. These facts completed the chain of evidence against mercury in syphilis, since it had been shown by experience of the most extensive kind that the disease in adults was always injured by the drug, instead of being alleviated. Bone disease, if it occurred without mercury, was very rare, since Syme, Weedon Cooke, and Spencer Wells had not seen cases. In fact, the empirical school of treatment of disease was losing its hold on many of the profession, and a six months' course of mercury to cure disease depending on a blood poison would soon be considered an absurdity. Parents much mercurialized were liable to have syphilitic children far more than others.—*Med. Times and Gaz.*, Dec. 2, 1865.

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26. *Traumatic Tetanus successfully treated by Opium Smoking and Internal Administration of Chloroform and Hemp.*—Dr. J. FAYRER, Prof. Surg. Med. Coll. Calcutta, relates (*Edinburgh Medical Journal*, Feb. 1865) the following interesting case of this:—

"Lukham Dass, a Hindoo labourer, aged 24 years, of small but muscular frame, received an incised wound from the sharp edge of a split bamboo, on the outer aspect of the end of the right forefinger. The wound being slight, and the hemorrhage trivial, he took no notice of it. Twelve days after the infliction of the wound, tetanic symptoms made their appearance, a feeling of constriction in the throat, rigidity of the jaws and muscles of the neck. The wound was dressed by a native, with some irritating application, which added to the mischief. Six days after the first appearance of trismus, he was admitted into Dr. Fayrer's ward on the 29th of August, at 7 A.M. Tetanic spasms and the risus sardonicus were then well marked. The mouth could with difficulty be slightly opened, and he was unable to protrude his tongue. The muscles of the extremities were in a state of permanent spasmodic contraction, as were those of the abdomen and back, the trunk being in a state of opisthotonos. The skin was of the natural temperature, and covered with sweat. The pulse quick and compressible. The spasms increased with great violence, lasting for a few seconds, and returning at intervals of five or six minutes. The fits were more violent when the wound on the finger was touched, but a touch anywhere, a breath of air, or the fanning of the punkah, brought on violent spasms. The bowels had not been moved for four days. Urine voided freely.

"*Aug.* 29, 8½ A.M. The two distal phalanges of the right forefinger were amputated. The wound had extended, exposed, and caused necrosis of the bones. The nerve trunks of the part removed were examined under the microscope and found healthy in appearance. After the amputation, which was done under chloroform, the patient became restless, and the spasms recurred with greater violence and frequency than before. Notwithstanding all this, he took, or attempted to take, some sago and milk. An enema of castor oil, turpentine, and assafœtida was administered, and ordered to be repeated every sixth hour. The enema not acting satisfactorily, two drops of croton oil were given; after this the bowels were freely relieved before the evening. He had also been brought under the influence of opium smoke; four grains of that drug having been smoked in a chillum (pipe) every third or fourth hour. With the opium he had been ordered chloroform ♏x, tinct. cannabis indicæ ♏xx, every second hour, with continual applications of ice in the intestine of an animal, to the entire length of the spine.

"30*th*, 8 A.M. He slept at intervals during the night; pulse quick and compressible; pupils not contracted; he seems quieted, but not narcotized by the opium and hemp; bowels have been moved again. The state of the mouth, neck, and rest of the body much as yesterday; spasmodic fits recur every five or six minutes; body bathed in sweat. The treatment to be continued as yesterday, but opium to be smoked every second hour so as to bring him fully under its influence.

"31*st*. The patient feels easier this morning; abdomen comparatively soft;

bowels moved last night; pulse not improved, quick and weak. He can protrude the tongue for about a quarter of an inch. He is made to take beef-tea and port-wine, with sago and milk, and eggs beaten into custard, with wine as frequently as possible, and these are supplemented with beef-tea. Enemata given after the cathartic enema has cleared the bowels out. The muscles of the extremities are rigid, and the whole body is covered with sweat. The chloroform has been increased to ♏xviij each dose, and gr. ij of extract of hemp instead of tincture; the enemata and opium smoking to be continued.

"*Sept.* 1, 8 A.M. Is quite under the influence of opium; pulse quick and compressible; on touching the ligature on the artery in the wound, the patient is thrown into violent spasmodic fits, which last for a few seconds only; the pupils are contracted, and the body covered with sweat.

"5 P.M. Bowels opened thoroughly; body in a state of opisthotonos. The medicines are to be continued, and instead of solid opium he is now to smoke a bazaar preparation of opium made for opium smokers.[1]

"*2d*, 8 A.M. The patient had some sleep during the night. The extreme rigidity of the abdominal muscles is diminished, and the fits recur at longer intervals, of half an hour or more. The pupils are contracted; bowels moved twice in the night. The muscles of the extremities are as rigid as ever; but the trismus is disappearing gradually. He can speak tolerably. He smoked about 34 grains of opium in the form alluded to in the note, during the last twelve hours. The hemp and chloroform as usual. The wound was dressed with the opium lotion.

"*3d*, 8 A.M. Body still in a state of opisthotonos; pupils contracted; body bathed with sweat. Mouth can be opened to the extent of one-fourth of an inch, but the general condition is one of spasm. The remedies, opium smoking, enemata, and ice to the spine, are continued as before.

"*4th*. Had disturbed sleep last night; pupils natural; pulse slow and compressible. Bowels moved twice this morning; the rigidity of the muscles is diminished; the wound of the amputated finger is cicatrizing; the ligatures have come away. The remedies are all continued as usual.

"*5th and 7th*. He has improved; the spasms have been less frequent, and less severe; the abdominal muscles much less tense, and he is able to protrude his tongue to the extent of half an inch. The quantity of opium smoked is about 70 grains daily.

"*8th*. The chloroform and hemp have been slightly increased, as they are beginning apparently to lose their effect. Opium smoked during this day about 50 grains; towards the evening he had a pain in the chest, with cough.

"*9th*, 8 A.M. The pupils much contracted; he is fully under the influence of opium; he is better as to the tetanic condition. The chloroform and hemp reduced to ♏xviij and gr. 1½ every four hours.

"*10th*. Bowels moved freely three times during the night; spasms diminishing; chloroform and hemp discontinued for a time, and tinctura ferri muriatis ♏x ordered to be given every four hours. It was found desirable to give the hemp and chloroform again in the evening. The ice applied to the spine; enemata and opium smoking as before.

"*11th*. Still pain in the chest; bowels moved three times during the night; medicines continued.

"*12th*. The chest is still painful; ordered turpentine stupes. In the evening, as the pain increased, he was ordered opium gr. j, ipecac. gr. ij, every four hours.

"*13th*. Pulse 108, very soft and compressible; body bathed with sweat. The opium and ipecacuanha discontinued; returned to the chloroform and hemp, and rub the chest, abdomen, and limbs with a liniment of camphor, opium, and chloroform. He smoked about 35 grains of opium since last report.

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[1] The natives of Bengal generally smoke opium in this form, which they call "goolie." It is prepared in the following manner: The guava leaf is cut into very small pieces, thoroughly dried in the sun or at the fire; an infusion of opium strained, and evaporated over the fire to the consistence of syrup; with this the dried guava leaf is mixed and reduced into a kind of paste. The mass is then divided into small balls or goolies, and each goolie weighs from eight to ten grains, and contains equal parts of opium and guava leaf. When smoked, it is placed on a piece of burning charcoal in the ordinary hubble-bubble or hookah.

"14*th*. Had sound sleep last night. He is gradually improving; the body is still in a state of chronic spasm, but it is much less rigid than formerly, and he is able to flex his limbs, open his mouth, speak, and take food easily. The least irritation brings on spasms still. The pains in the chest, no doubt the result of the spasm, are somewhat better. He takes his food fairly; upon an average he disposes of about 80 grains of the opium preparation daily.

"19*th*. He continues to improve; is able to raise himself into a sitting posture, but still the slightest irritation brings back the spasms, though with less violence. The muscular pains are much reduced by friction with anodyne liniment. He was placed on his feet and supported; attempted to walk, but the effort brought on spasm, and the rigidity remained more or less throughout the day.

"20*th*. A gentle current of electric magnetism tried, but it brought on the spasm more violently, and was immediately discontinued. The improvement is now steadily progressing, and he sits up in bed, though with some difficulty. The medicines, ice to the spine, and opium smoking are still continued; he has become fond of the opium, and says he can't do without it.

"30*th*. Doing well. The ice to the spine was discontinued, as it caused a burning pain. The other remedies and diet, which is of a nutritious character, are continued.

"After this the improvement was gradual but sure; but for some time he complained of pain and stiffness in the muscles generally. He gradually regained the power of walking without aid. The medicines were diminished by degrees, and the quantity of opium reduced to half.

"We found on examining him, after he was able to stand erect, and walk, that the spinal column had been curved laterally to a considerable extent at the second, third, and fourth dorsal vertebræ. He had been perfectly straight, and well formed; but now the shoulder is prominent, and his height considerably lessened. The result of the continued muscular spasm has been to distort the spine, and though he has recovered, it is with this deformity.

"He left the hospital on the 11th October, and walked home. He was much emaciated and aged in appearance, as well as altered by the lateral curvature.

"The quantity of opium goolie consumed from the 1st to the 30th September was nearly ʒxlij. which gives an average of 84 grains per diem; of course much of this was lost in smoking, but still the quantity actually inhaled was large.

"*Remarks.*—The above notes of the progress and treatment of a case of traumatic tetanus are very interesting, as they appear to indicate that opium smoking, if freely and persistently continued, has a controlling power over this mysterious disorder, enabling the patient to live through the terrible exhaustion that it produces.[1]

"The results of the treatment of traumatic tetanus, when well developed, have hitherto, in my experience, been most unfortunate, and I cannot but regard this case as a very satisfactory one, as it enables me to feel that I have a more potent remedy at my command than any I have hitherto employed. I believe I have left none of the recognized methods of treatment untried; and in traumatic tetanus, I may say they have all, with the exception of division of the nerve trunk of the wounded part, disappointed me. Some time ago, I treated a case of severe traumatic tetanus, caused by a wound of the ball of the thumb, by section of the median nerve, about the annular ligament, and the result was most satisfactory; but in that case the tetanic symptoms had only recently set in, and no permanently ill effect had been set up in the spinal cord. I believe that though this treatment would frequently be of service if practised early, it is useless if resorted to after the disease has been thoroughly developed for even two or three days. In the case here detailed, however, it had been of much longer duration when the patient came under treatment, and yet the result was satisfactory.

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[1] I am indebted to Dr. Gordon, C. B., for the suggestion of treating this case with opium smoking.

"It may be said that the large and repeated doses of hemp and chloroform, with the ice to the spine, may have been the causes of the curvature; no doubt they were to a certain extent, but I have treated many less severe cases with them, with little other effect than that of promoting euthanasia."

27. *Subcutaneous Section of Carbuncle.*—In June, 1852, Mr. French, surgeon to the St. James's Infirmary, brought before the Medical and Chirurgical Society a plan of treating carbuncle which he had pursued with great success for many years. It consists in the subcutaneous section of the indurated tissue by a tenotomy knife, which is introduced a little beyond the edge of the induration; and, the forefinger of the left hand serving as a guide upon the surface, the tumour is divided just as a tendon would be cut through. The skin itself is left uninjured. If the carbuncle is large, this process is repeated in different positions, so that the mass is crucially divided subcutaneously. We have seen a large number of cases treated by this method. The immediate relief obtained, and the rapid recovery which follows, are very striking. Every surgeon who has practised the old operation of crucial incision knows that it is necessary to cut deeply enough to divide the hardened base of the carbuncle. Mere division of the skin is useless; more than this, it is mischievous, for a widely gaping wound is formed, which is often most troublesome to heal, and leaves eventually a very ugly cicatrix. This is entirely avoided by Mr. French's process.

The following is a case of carbuncle in which Mr. HEATH pursued this plan with the highly satisfactory result recorded:—

Henry W., aged forty-six years, was admitted July 3d, 1865, with a large carbuncle on the back, measuring six inches in diameter each way. This had been coming for ten days, and two days before admission the skin in the centre had given way, exposing a slough, but the surrounding tissue was greatly swollen and inflamed, and he was suffering great agony.

July 4. The patient having been placed under chloroform, Mr. Heath made a crucial subcutaneous section of the carbuncle with a narrow bistoury. The knife was entered at the margin of the inflamed skin, carried well beneath the carbuncle, and the point brought up to the central opening, when the whole thickness of the subcutaneous tissues were divided crucially, the knife being entered four times on account of the large diameter of the carbuncle. The hemorrhage was very free, and was checked by a pad and broad bandage. Low diet; beef-tea, two pints; wine, ten ounces. Aromatic spirit of ammonia, half a drachm; liquor of cinchona, fifteen minims; water, one ounce: three times a day.

5th. Passed a good night, the pain being greatly relieved by the incisions. Pad removed. The inflammation has considerably subsided, and a small quantity of pus exudes from each puncture. Poultice.

12th. Patient's recovery has been uninterrupted. The inflammation has entirely subsided; the hole in the centre has not increased, and a slough of cellular tissue is now separating.

14th. Water-dressing to wound, which is quite clean. Full diet. Dilute nitro-hydrochloric acid, twenty minims; liquor of cinchona, fifteen minims; water, one ounce: three times a day.

21st. Convalescent, and on the 25th he was discharged cured.

The same principle has been lately adopted by Mr. Shaw, at the Middlesex Hospital, in some cases of large and exceedingly painful syphilitic nodes upon the tibia. These swellings are sometimes so hard as to give the idea of osseous growths, but they will generally be found to consist of thickened periosteum, rendered extremely tense by a semi-liquid effusion under it. The pain experienced is intimately connected with this tension. The section of the swelling by a tenotomy knife, introduced under the skin and made to cut downwards towards the bone, produces very rapid relief to the suffering, and the disease itself is not rendered thereby less amenable to the curative influence of iodide of potassium, which generally acts so favourably in such cases.—*Lancet*, Oct. 21, 1865.

28. *Enlarged Spleen Removed by Excision.*—Mr. SPENCER WELLS exhibited to the Pathological Society (Nov. 21, 1865) an enlarged spleen removed by

excision the day before the meeting. The patient was going on tolerably well when Mr. Wells saw her (thirty hours after operation) on his way to the meeting.[1] When removed it weighed six lbs. five ounces, but as nine ounces of blood had drained from its vessels. it now weighed five lbs. twelve ounces. It was eleven inches long, eight broad, and three to four thick. It appeared to be simply hypertrophied, though some spots on the surface appeared like commencing amyloid or lardaceous change. It was not cut into, however, as, being the first case in which the operation had been done in this country, it was to be sent to the museum of the College of Surgeons. Mr. Wells added, that when Mr. Nunn showed a large spleen in that room two or three years ago. and he (Mr. Wells) had suggested that the patient's life might possibly have been saved if the spleen had been removed, Dr. Wilks had approved of the suggestion, and he (Mr. Wells) determined to try what could be done if he met with a suitable case. Soon afterwards he attended a lady, with Dr. Jenner, who had a very large spleen; but there was such extreme leukhæmia coexisting that operation was never seriously thought of. The lady died near Bristol, and Mr. Clarke, of Clifton, who examined the body, was specially requested to do so with reference to the removal of the spleen. He informed Mr. Wells that it was done quite easily, and that, in his opinion, all the bloodvessels might have been easily secured. Mr. Wells afterwards saw cases of enlarged spleen with Dr. Budd. Dr. Boulton, of Horncastle, and Dr. Gill, of Bow; but in these cases they were the result of intermittent fever, and not in a state of health to render a hazardous operation necessary or justifiable. At length the patient whose spleen was before the society consulted him six weeks ago. She was married, 34 years of age, and the mother of two children. She had only been ill abôut a year, and the tumour had only been discovered six months. Its growth had been slow at first, but very rapid lately. Mr. Wells prescribed bromide of potassium and quinine. This proving useless, iron was given; and this being equally useless, excision was proposed, and Dr. Jenner consulted, who said she was dying, that medicine could do no good, while an operation did offer the "*shadow of a chance*" of success. Upon this the patient and her husband desired that the trial should be made. Mr. Wells found the operation quite easy. An incision, seven inches long, was carried along the outer border of the left rectus abdominis. and the spleen was turned out very easily. The vessels were secured by silk ligatures, which were cut off short and returned. There was very little bleeding. The patient had recovered from the shock, there were as yet no signs of peritonitis; and, if she should recover from the operation. all that we know of removal of the healthy spleen in dogs, and in man accidentally by wounds, led to the hope that the absence of the spleen might be tolerated and a good state of health regained.

Dr. Crisp said the case was a very interesting one, but he did not think it was parallel with cases of removal of spleen from dogs. He had, he said, never seen a healthy liver with such a spleen. He thought the liver had more to do with blood formation than the spleen had.—*Med. Times and Gaz.*, Dec. 2, 1865.

29. *Entire Tongue Successfully Removed during Life.*—Mr. Nunneley exhibited to the Pathological Society (Nov. 21, 1865) a specimen of the entire tongue which had been removed nineteen days before, from a man aged 35. by a submental opening. He never had a bad symptom, and is now quite well. The disease, which had existed sixteen or eighteen months, became worse two months before the operation, and from the pain and difficulty of speaking, the impossibility of mastication, and difficulty of deglutition, was fast wearing the patient out. He has already recovered strength and flesh; indeed, he says that he is as well as he ever was. Talks with great distinctness and swallows with facility.—*Med. Times and Gaz.*, Dec. 2, 1865.

30. *Congenital Luxation of the Patella.*—Mr. William Stokes, brought under notice of the Dublin Pathological Society (Dec. 17, 1864), a case of congenital luxation of the right patella. This deformity occurred in a boy aged

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[1] We have since heard that she lived a week, and died of pyæmia, with effusion into both pleural cavities and pericardium, but no hemorrhage nor peritonitis.

nineteen years, who on the 15th of last October applied at the dispensary of the Meath Hospital to obtain relief from a severe pain in the left knee-joint. Upon examining the part, however, Mr. Stokes could not find that there was indication of any local inflammation, or of any other cause for the pain. Wishing to compare the two limbs, he requested the patient to expose the right knee-joint; and on this being done he was struck with the remarkable deformity which it presented, the patella being completely luxated outwards. The patient could give no information as to the cause of this deformity. He stated that he had had it as long as he could remember anything, and that he had never consulted any physician or surgeon with regard to it, as the malformation had never given him any uneasiness, and interfered but little with his progression. From this account Mr. Stokes suspected that the case was one of congenital malformation; and this view was strengthened on carefully examining the joint, for on doing so he found the external condyle of the femur was altogether deficient. This deficiency, then, and the natural anatomical causes for luxation of the patella outwards, appeared to be the two etiological conditions which produced the malformation. The mother of the patient also stated that her son had this condition of the knee from the time of his birth.

Cases of congenital luxation of the patella are of extreme interest in consequence of their great rarity. Since the formation of the Pathological Society of Dublin only two examples of it had been exhibited, both of them by the distinguished Secretary, Professor Smith. In one of them there was, as in the present case, a complete failure of the external condyle of the femur. There was also a congenital luxation of the radius on one side. In Mr. Stokes' case there was no luxation in either of the upper extremities, the congenital malformation being confined to the right knee-joint. Professor Smith had mentioned to him that he had seen, a few years ago, in St. Bartholomew's Hospital, a young lad on whom there existed a congenital luxation of the patella outwards upon each side; but there was, in this instance, no malformation of any of the bones composing either of the articulations.

It was remarkable, when we looked into the literature of the subject, how few instances were recorded of this peculiar deformity.—*Dublin Quarterly Journal Med. Sci.*, May, 1865.

A very interesting case of this deformity is related by Dr. Caswell in the number of this Journal for July, 1865, p. 82.

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31. *Compound Dislocation of the Astragalus—Reduction, with Recovery of a Useful Limb.*—The following case of this, recorded by Dr. JAS. A. GRANT in the *Canada Medical Journal* (Oct. 1865), is remarkable for the recovery of the limb after the very great extent of injury to the joint.

J. M. æt. 35, a robust farmer, while driving a cart, June 24, 1864, in consequence of his horse taking fright, was thrown out with violence and dragged for some distance, his foot catching in the wheel as he fell. He attempted to walk, but was unable, observing that he trod on the outside of the foot, at the same time the suffering was very great. The boot being removed, the following appearances were to be observed. The foot inverted so that the sole looked inwards, tendo-Achillis not tense, the astragalus was driven forwards entirely out of its place, where it took a transverse position, and the anterior extremity protruded fully an inch through the integument on the outer side of the foot. On the upper part of the tarsus the skin was stretched tightly over the displaced astragalus. There was no fracture of either the tibia or fibula. There was very little surrounding effusion, so that the outline of the various parts could be well defined. The dislocated bone was thus wrenched from all of its connections, and thrown transversely across the tarsus. An unsuccessful attempt was made to reduce the dislocation, by extension and pressure. The limb was placed quietly on the bed, and by moderate pressure the bone turned and shot into its place quite unexpectedly. An outside splint was forthwith placed on the leg, and a cold lotion applied over the ankle. An opiate was given at bedtime, and the following day he entered the General Protestant Hospital. The cold water cloths were constantly applied until the 8th day after the accident, and then a purulent discharge from the joint having been observed, a linseed poultice was substituted. The discharge continued more or less until the end of August, at which time the wound closed perfectly. The limb continued in a weak state until March, 1865; he was then able to throw aside the sticks, and use the limb with considerable freedom.

From this date the parts gained strength, and at present he walks about as well as ever, and performs the various duties of farm life, the limb having regained perfect motion, the parts surrounding the displaced bone resembling in every respect those of a healthy joint.

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32. *Fissured Fracture of the External Table of the Skull produced by a Bullet striking the inside of the Skull.*—Mr. TEEVAN exhibited to the Medical Society of London (Oct. 16, 1865) a specimen of this, taken from a Swiss who shot himself and died in one of the London hospitals. The bullet entered the right parietal bone, traversed the brain and its membranes, struck the inner surface of the left parietal bone, and remained imprisoned in the cranium. There was no fissure or fracture at the spot on the inner surface of the left parietal bone where the bullet struck, but at the corresponding spot in the outside of the bone there was a starred, fissured fracture of the external table only. Mr. Teevan remarked that this variety of fracture had never been described, and that he brought forward the specimen to corroborate his own experiments on this subject, and in support of the statement which he had made to the Society on a former occasion—that, whether the inside or outside of the skull be struck, fracture of the distal table only, without injury to the proximal one, can be produced in either case, and that such fracture occurs in obedience to a well-known physical law—that fracture commences in the line of extension, which is the distal side, and not in that of compression.—*Lancet*, Nov. 4, 1865.

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33. *Fracture of the Larynx complicated by Œdema Glottidis; Tracheotomy; Recovery.*—The following interesting case of this is related (*Canada Medical Journal*, Sept. 1865) by Dr. DONALD MACLEAN, Lecturer on Clinical Surgery in Qeeen's University.

Wm. Rancier, a farmer, aged 32, married. When first seen [15th June] was propped up in bed in a sitting posture, unable to articulate or perform the act of deglutition, bloody saliva trickling from his mouth, expression of countenance extremely anxious, respiration difficult and stertorous, face, neck, head, and upper part of thorax distended by emphysema, pulse feeble and extremities cold. In reply to my inquiries the following statements were received. Patient had been chasing a dog out of his way while at work in the woods, and while running after the dog and in the act of throwing a stick at it, tripped and fell forward, striking his neck with great violence against a stump, the height of which was sufficient to prevent his hands from reaching the ground.

Making a strong effort, he sprang to his feet and attempted to recover his breath, but he found it impossible to take a full inspiration. On putting his hand to his throat he discovered that it was much swollen, and that the swelling was extending rapidly upwards over the face and back of the head. At the same time blood began to flow pretty freely from his mouth.

All these circumstances conspired to alarm him very much, still with the assistance of a man who had been working with him, he walked to his house, a distance of about two hundred yards. A messenger was at once dispatched for medical aid, and about twelve hours after the accident, I arrived at the patient's residence (which is about twenty miles distant) and found him in the condition I have already described.

On proceeding to manipulate the parts there was no difficulty in discovering that the thyroid cartilage (at least) was fractured, the pomum adami was absent, and crepitus could be distinctly felt; over and above the crepitation of the emphysema, and by pressing on the left ala of the thyroid cartilage, respiration was entirely arrested and acute pain felt. At this time I was of opinion that the cricoid cartilage also was fractured, but at subsequent examinations could never detect the abnormal prominence which on this occasion I supposed to have been produced by fracture of the cricoid. The emphysematous and otherwise unnatural state of the parts of course rendered precise manipulation impossible. For the same reason I found it impossible to discover the exact extent and direction of the fracture of the thyroid.

At this time there appeared to be very little in the way of treatment, necessary or admissible. I attempted to restore the thyroid cartilage to its natural position and form, but with only very partial success.

A bandage was applied pretty firmly around the neck with the effect of facilitating respiration to some extent, and enemata were ordered, first laxative and afterwards nutritive. At an early hour, on the morning of the 16th, I left him with instructions to keep me informed as to his progress.

On the 17th a very unfavourable report was received, in consequence of which I revisited him early on the 18th, provided with a conveyance suitable for transporting him to Kingston. On this occasion I found him very much changed for the worse, respiration laboured and painful, pulse small and irregular, countenance intensely anxious and haggard; he had not slept since the accident occurred, nor had he attempted to swallow anything since my previous visit; his whole body was bathed in a cold clammy sweat, and altogether he appeared to be in immediate danger of sinking. On making the attempt he found that deglutition could now be performed with comparative ease and comfort, consequently a mixture of brandy and milk was freely administered with the effect of very rapidly improving his condition.

On 19th and 20th patient complained a good deal of sleeplessness, in fact he had hardly slept at all since the accident occurred; otherwise everything seemed to be going on well.

On night of 20th he became restless and anxious, complained of difficulty of breathing and pain in the neighbourhood of the larynx. He walked about the room nearly the whole of the night, and at daylight on Wednesday morning became suddenly much alarmed by the rapidly increasing dyspnœa, and what he described himself as "a sinking feeling." At this time he stated to me his conviction that he had not many hours to live—a conviction which I found it impossible altogether to remove.

At ten A. M., Dr. Dickson saw the case with me, and several unsuccessful efforts were made to obtain a view of the rima glottidis; the most cautious manipulation inducing violent reflex action.

The power of deglutition, though impaired, was not altogether lost, and fluid food and stimulants were freely administered.

At 8 P. M., the dyspnœa had become very distressing, and it was evident that unless relief could be afforded in some way, very soon the man would die asphyxiated.

Dr. Dickson now revisited the case with me, and at last succeeded in obtaining a satisfactory view of the fauces and upper part of the windpipe, when it was seen that the glottis was all but occluded by œdema.

The course was now quite clear, and I proceeded at once to perform the operation of tracheotomy. It would indeed be difficult to imagine a more unfavourable case for the operation. Between emphysema and exudation, the trachea was very deep, the veins of the neck were of course distended to their utmost capacity, and the patient was struggling violently for air.

Having cut into the trachea and introduced the largest size tracheotomy tube, we were disappointed to find that no air passed into the lungs, from which it was feared that an insurmountable object existed lower down.

The case now appeared desperate, and the man was on the point of dying asphyxiated, when I seized a silver male catheter and at once passed it into the trachea and beyond the obstruction with the immediate effect of affording the patient an adequate supply of air.

I subsequently prolonged the incisions downwards, and introduced the tracheotomy tube, which now worked quite satisfactorily.

The tube having been tied in the usual way, and the patient comfortably propped up in the large arm chair in which the operation was performed, he fell into a sound and natural sleep for more than seven hours; this was the first good sleep he had had since the receipt of the injury.

Up to this time indeed he had never been asleep for more than five minutes at one time, and very seldom even for this short period.

On the morning of the 21st he felt, comparatively speaking, very well. Respiration was performed with perfect ease, the fear of impending dissolution no longer oppressed him, and he was able to partake freely of food and stimulants. Nevertheless, there was an evident tendency towards sinking, the pulse did not respond to the stimulants which were administered with the utmost liberality. He slept a great deal, and was frequently suffused with a cold sweat.

This critical condition lasted for two days, after which he gradually recovered his strength. The emphysema disappeared and the neck and face resumed their normal appearance. On Saturday, June 29th, I removed the tube, and stitched up the wound with metallic sutures. Since then the patient has been working in his harvest field, and when last seen (a week ago) was in perfect health.

Fracture of the cartilages of the larynx is extremely rare, still a few well authenticated cases have been recorded by MM. Sodoly, Oliver, Margolin, Plenck, Morgagni, Remer, and Dr. Frank H. Hamilton of New York.

In all these cases the effects of the injury were either so slight as to require no surgical interference or else so serious as to be fatal.

Dr. Hamilton's case is, so far as I am aware, the only one in which tracheotomy was performed; in this and in several other respects, the most striking resemblance will be observed between that case and the one I have just described.

The principal difference between the two cases consists in the fact that Dr. Hamilton's case died of exhaustion seventy-two hours after this accident, and thirty-four after the operation.[1]

OPHTHALMOLOGY.

34. *Strumous Ophthalmia, with Reflex Contraction of the Orbicularis Palpebrarum.*—The *Lancet* (Nov. 4, 1865) contains a paper on this subject by Mr. Athol A. Johnson, the principal points in which are as follows:—

1. One form of strumous ophthalmia is characterized by *inability* to open the eye, in consequence of *involuntary* contraction of the orbicularis palpebrarum.

2. This reflex contraction is in relation with hyperæsthesia of the retina or first nerve *alone*, or (more generally) of the ophthalmic branches of the fifth likewise.

3. The hyperæsthesia of the conjunctival, lachrymal, and nasal branches induces the reflex acts of closure of the eyelids, lachrymation, and sneezing.

4. The hyperæsthesia is occasionally uncomplicated; but in most cases, it is soon followed by low inflammation of the conjunctiva, cornea, &c., dependent possibly on the impaired nutrition of the membrane from the altered nervous action, as well as from the mechanical irritation of the parts.

5. For the relief of this hyperæsthesia and spasmodic contraction of the lids, such medicines as belladonna, hyoscyamus, conium, or stramonium, which allay nervous sensibility and relieve spasm of the sphincters, would seem to be indicated; and of these, belladonna certainly has been found to be practically useful.

35. *Blennorrhagic Conjunctivitis treated by Alcohol.*—A man aged 22, suffering from purulent gonorrhœal conjunctivitis in the left eye, was admitted into La Pitié under M. Gosselin. The eye had been affected five days. On admission, the eyelids were swollen, red, and glossy; their edges were agglutinated by thick yellowish pus. There was intense photophobia. The palpebral conjunctiva was red and thick, and its lower *cul-de-sac* contained a large amount of pus. The conjunctiva of the eye was much injected, forming a considerable chemosis around the cornea, and presenting on its surface purulent deposits. The cornea was healthy, transparent, and neither ulcerated nor opaque; the anterior chamber and iris were healthy, and the pupil regular and movable. The

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[1] Hamilton on Fractures and Dislocations, page 135.

patient complained of severe pain around the orbit. The right eye was healthy. The patient had had gonorrhœa nearly a month, when the eye became inflamed; but he could not tell how or when it had become inoculated. The next day, the treatment was commenced by injecting every two hours a mixture of one-third of spirit in two-thirds of water; the eyelids being held apart, the injection was applied by means of a small glass syringe. The first application produced severe pain, which lasted about ten minutes. In the intervals between the injections, cold water dressing was applied. Three days afterwards, the condition of the eye was much improved; and the patient was ordered to keep applied to the eye a mixture—one-third as strong as that already described, and to have the injection used three times a day only. Ten days after the commencement of the treatment, the cure was complete. Notwithstanding every precaution, the conjunctiva of the right eye showed some injection and redness, but this soon ceased on the application of compresses dipped in a mixture of one part of spirit and three parts of water.—*Brit. Med. Journ.*, Sept. 16, from *Bull. Gén. de Ther.*, May 30, 1865.

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36. *Sympathetic Ophthalmia.* By MM. GUÉPIN and WECKER.—M. Guépin, of Nantes, believes that reflex ophthalmia would be a preferable appellation for this affection. He states that in the early period of his career he treated it by mercurial frictions, belladonna, and bleeding, and that many of his patients became blind, although he found the advantage in several cases of traumatic ophthalmia of extracting the cataract and liberating the iris from tension as a means of relieving the temporal and supra-orbital pains which so often precede the internal fluxion. Since 1838, however, he has acquired the conviction that sympathetic ophthalmia is almost always a sign of debility, and that bloodletting does not constitute the best antiphlogistic; and he now finds himself, by the employment of ammoniacal vesicants, cupping at the nape, and the use of mercurials, joined to a careful watching of the progress of the case, always able to prevent the development of the affection. During the twenty-six years in question he has, it is true, frequently practised the ablation of the anterior portion of the eye, extracted cataract even during the acute stage of the inflammation, and performed iridectomy, in order to assuage pain in an organ whose functions were lost or nearly lost; but he avers that he has never so acted under the idea of preventing the supervention of sympathetic ophthalmia, as he has always found this readily yield to the treatment indicated.

We have thought it right to place on record the results of the observation of so experienced a practitioner as M. Guépin, but the practice of M. Wecker will be found more in harmony with that which prevails amongst ourselves. He recently delivered a clinical lecture for the express purpose of impressing upon his auditors the necessity of performing the speedy enucleation of the eye, as the only preservative from sympathetic ophthalmia to be relied upon. In some exceptional cases this remedy may prove of efficacy even after the inflammation has commenced; and he relates an interesting example of this, in which the mischief was arrested with remarkable rapidity. The sympathetic ophthalmia manifested itself under the form of serous iritis in the right eye of a man fifty-nine years of age, whose left eye, struck with a fragment of steel three years since, rapidly atrophied, retaining much morbid sensibility, which was capable of being roused by pressure even at so remote a period. The only effect of a partial ablation of the eye, performed three and a half months after the accident, was the production of prolonged and painful suppurative inflammation in the remaining portion of the organ. On the patient's admission, the pupil was neither irregular nor encumbered with plastic deposits. There were slight diminution of colour and contractility of the iris, some injection of the perikeratic vessels, moderate ciliary pains, and amblyopia somewhat more considerable in proportion to the intensity of the other symptoms. These symptoms were in themselves of little consequence, but considered in connection with the history of the case, and the efficacy of the rational means of treatment which had been adopted, they indicated a condition of such gravity that enucleation was at once performed. The success which followed was remarkable, for the disease, which had remained stationary during several weeks, now rapidly yielded to ordinary remedies. But all this case teaches is, that under such circumstances we should not absolutely despair, as we may exceptionally succeed, even after inflammation has been set up; but the true manner of regarding enucleation is to view it as a prophylactic, the opportunity for employing which has already passed away when the earliest morbid phenomena have appeared. "Enucleation, in fact, becomes urgent in any case in which an eye injured by a foreign body that induces inflammation and destroys all perception of light, remains after the loss of its functions hard to the touch and spontaneously painful—almost certain signs that the vulnerant body remains within the injured organ. Moreover, it should be practised whenever an eye, whether injured or not, lost to vision, becomes a source of annoyance to its owner by remaining the seat of continuous or intermitting pains of a certain intensity. Not only may we in this way prevent sympathetic ophthalmia, which may take its point of departure from these pains, but we restore to the patient a peace and repose of which he has been sometimes deprived for several years." As to the partial ablation of the organ, which has been recommended as a substitute for enucleation, as affording more facility for the adaptation of an artificial eye, not only is its prophylactic efficacy unestablished, but it too often gives rise to very painful suppurative inflammation. Even after enucleation, too, the divided muscles, retracted though they be, will usually impart a considerable amount of movement. "To sum up: this is the sole method which indubitably secures the patient from sympathetic ophthalmia, and of all the operations which have been proposed to this end it is the most certain, the most easy, and the least dangerous in its consequences. To convey an idea of the importance which I attach to conservative enucleation executed in opportune time, I may be allowed to say that I should prefer performing it ten times without absolute necessity, to neglecting it once in a case of misunderstood urgency."—*Brit. and For. Med.-Chir. Rev.*, Oct., from *Annales d'Oculistique*, May, 1865.

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37. *Retinal Disease occurring in the Course of Kidney Disease.*—In the No. of the *Med. Times & Gaz.* for Nov. 18, 1865, there are reported a number of cases, from several sources, showing the connection of certain changes in the retina with Bright's disease.

Mr. Hulke gives, in the same journal for Jan. 2, 1864, the following account of these changes:—

"The structural alterations which give rise to these morbid appearances have been ably worked out by German investigators, with whom the retinal disease appears to be more common than with us. Summed up briefly, the grayish opacity of the nerve-disk and retina proceeds from serous infiltration, from sclerosis and hypertrophy of the connective tissue, and from a nodular thickening of the nerve fibres, which acquire such dimensions that some have maintained them to be sclerosed ganglion cells. The small, brilliant white dots are groups of large granular oil-corpuscles, situated in the layer of the outer and of the inner granules. Schweigger supposes that they originate in the connective tissue corpuscles. The redness of the optic disk is from capillary congestion, and perhaps also from the presence of new vessels. The apparent interruption of the vein is due to the intervention at those spots of a thicker layer of opaque retinal tissue between them and the observer. The white appearance of the arteries is caused by amyloid changes in their walls, with corresponding diminution of their calibre. The hemorrhages proceed from—*a*, the disturbed vis capillaris resulting from the morbid state of the blood produced by the kidney disease; *b*, an increased mechanical resistance to the free efflux of blood through the veins at the nerve-disk offered by the sclerosed connective tissue; *c*, and in some cases, hypertrophy of the left ventricle, which urges the blood more freely into the retina than it is able to escape from it. These are the morbid changes which cause the loss of sight. The sudden obscurations (distinguished from accidentally discovered pre-existing dimness) depend on hemorrhages, and their recession coincides with the removal of the extravasated blood. Some cases are susceptible of considerable improvement by treatment. That which I often follow consists in putting a leech to the temple once a week, and the internal exhibition of the tinct. ferri muriatis. Corrosive sublimate, so useful in some forms of retinitis, has not appeared to me to be serviceable here."

Mr. ERNEST HART, in calling attention to a case of advanced albuminuric retinitis at St. Mary's Hospital, remarked that it was of particular interest to ascertain how far the disturbances of vision, associated with nephritic albuminuria, were pathognomonic, and what extent the ophthalmoscopic examination of the eye, in patients so affected, could assist the diagnosis or aid the treatment. Ophthalmic surgeons occasionally meet with cases of acute retinitis albuminurica in which the affection of the sight is the first striking symptom, and in which the ophthalmoscope anticipates the diagnosis of the physician, derived from the clinical history and the chemical analysis of the urine. Such cases, however, were, in his experience, rare, and usually were examples of oversight due to various causes, such as eccentricity of the complaint or of the patient, and unusual complications diverting the attention of the physician. In the case in question the patient had come to a practitioner complaining of acute pains in the ankles—"rheumatic pains," as he himself called them. That diagnosis had seemed to be borne out by various collateral circumstances, and had passed muster; meanwhile, however, and rapidly, the sight had become very much disturbed, and, as the man's livelihood depended upon his keen perception of minute textile difference of structure, he was quick to perceive and to suffer from this deterioration of the acuteness of his vision. When examined by Mr. Hart, the ophthalmoscope immediately revealed, in the right eye, the most marked and considerable retinal changes, perfectly diagnostic of albuminuric retinitis, obscurity of the papilla, bright fatty patches of the retina, with a tendency to grouping around the yellow spot, and irregular extravasations of blood affecting the linear arrangement. The diagnosis was permissively positive, for the changes accompanying albuminuric retinitis once seen cannot be mistaken. The vision of the eye was considerably affected, much more so than the patient had been aware till the eyes were tested separately. Only No. IV. Giraud Teulon's type could be read at the ordinary reading distance. The examination of the urine showed a large amount of albumen. Treatment by muriated tincture of steel with a free use of the Turkish bath failed to relieve the patient, and he died at the end of three months, all but blind with the right eye, and having very imperfect vision with the left. The pathological changes were of a typical character, the ecchymoses becoming more numerous, the fatty patches coalescing, and the macula lutea being almost entirely destroyed; the retina was not detached. Mr. Hart expressed the opinion that the ophthalmoscopic observation of these symptoms was interesting, as affording a means of studying the changes which the nervous, like the other tissues, undergo in this blood disease, but they afford no indications for local treatment, which, indeed, in such a condition, would be out of place. To what extent could repair go on after serious destruction of the retinal nerve tissue? An examination of a series of cases of albuminuric retinitis might afford the answer. He had not had the opportunity of witnessing any case in which good result had attended treatment, but probably others might have done so. He knew of no record, but would hesitate to believe that nephritis with albuminuric retinitis was always fatal. This was a point to be decided by the accumulation of evidence.

There were, however, other and more trifling affections of the sight in nephritic albuminuria which came under the notice of the ophthalmic surgeon, in which the ophthalmoscope revealed nothing, but to which attention should be directed, because he believed that, as they were of earlier occurrence so they were of greater value in directing treatment. There is a form of intermittent dimness of vision unaccompanied by ophthalmoscopic change which had frequently come before him, and in which, guided by the observations of Landouzy, he had always looked for albuminuria in the urine, and several times he had found it. It was unassociated with any apparent change in the retina, and was probably due to the cerebral disorder either precedent to or consequent upon albuminuria. M. Landouzy, who approached the question from the simple study of the naked eye symptoms, had drawn the following conclusions from his study: 1. That the disturbance of vision is an almost constant symptom in albuminous nephritis. 2. That these troubles constitute a new species of amaurosis, which may be called albuminuric. 3. That the albuminuric amaurosis cannot be attributed to the deterioration of the strength. 4. That it very often announces the disease as an initial sign, before the invasion of the pathognomonic accidents. 5. That it appears and disappears, and then returns without exactly following the phases of the albuminous deposit in the urine or of the œdema. 6. That it should lead us to consider albuminous nephritis as an alteration of the ganglionic system.

Mr. Hart remarks that Dr. Roberts, in his recent work, attributes the "hemorrhagic blindness" of retinitis albuminurica, which he speaks of as in no sense uræmic to the hypertrophy of the left ventricle, which so commonly accompanies a contracting kidney and the increased tension in the arterial system consequent thereto. But that this explanation, while it assists to understand the frequency of the extravasation from rupture of small retinal vessels, would be incomplete unless we recalled also to the mind the considerable fatty degeneration of the retinal connective tissue and the sclerosis of the nerve-fibres. The deposit of fat was frequently locally anterior to the appearance of ecchymoses. The value of ophthalmoscopic examination in all cases, whether of amblyopia or retinitis albuminurica, was thus apparent, both in reference to the negative information which it afforded in the one case, and the positive data supplied in the other. Intermittent amaurosis associated with albuminuria pointed, he said, to a train of causes very different to those connected with the incomplete but persistent blindness due to fatty substitution and inflammatory destruction of the nerve fibres of the retina. It was to be observed how much more complete the loss of vision was for the time where, as in the amblyopic state noted, the cause was central, than where, as in the true albuminuric retinitis, the loss of vision was due to peripheral disorganization. A considerable amount of retinal disease was compatible with the retention of considerable power of sight; and thus, as in other forms of disorganization of the retina, especially pigmentary retinitis, the patient did not discover the serious affection of the eyes until the disease had extended very far. Hence, if the use of the ophthalmoscope were deferred until urgent symptoms appeared, the examination was apt to be put off till the changes of doing good were materially diminished. It was the more important to remember this because it was precisely in the case of peripheral disease that the ophthalmoscope afforded the most extended and most useful information, and enabled the surgeon or physician carefully to intervene, if in time and in suitable cases.

Mr. Hutchinson, in some clinical remarks at the Royal London Ophthalmic Hospital on cases of disease of the retina from Bright's disease, mentioned that he had repeatedly diagnosed the existence of the latter from observation of the state of the eye. It was not, he observed, in the cases of Bright's disease, attended by dropsy, and, therefore, furnishing their own clue at a glance, that retinal changes were most often met with. It was rather in a group of insidious cases, in which patients become dyspeptic, suffer from general malaise, and lose colour without showing more definite symptoms, that retinal deposits are met with. He related some instructive facts illustrating this, and proving also how important a good knowledge of the ophthalmoscope is to the general physician. In one, a gentleman from Liverpool had been for a long time under medical treatment on account of dyspepsia, and at length found his sight failing. For the latter symptom he came up to town, and on using the ophthalmoscope the conditions characteristic of Bright's disease were at once found, and on examination of his urine, albumen was detected. In a second instance, a lady from New Cross was sent to Mr. Hutchinson by her medical attendant with the history that for a year past she had suffered from great irritability of stomach and was now losing her sight. Her retinæ showed apoplexies and albuminoid deposits, and this led to examination of the urine with the result anticipated. In neither of these two cases had the patients ever suffered from dropsy or œdema of the feet. A third case was yet more interesting since the discovery of retinal disease was made under very unusual circumstances. Last winter a man was admitted into the London Hospital having been found insensible in a woodyard. He was a workman in the yard, and was believed to have fallen from a stack of wood, but no one had seen him fall. His head was bruised, but no serious injuries could be detected; as he was quite insensible, no history could be obtained from himself. The pupils were dilated. On using the ophthalmoscope, Mr. Hutchinson found, to his surprise, the usual evidences of Bright's disease in both retinæ. There were patches and dots of deposit and large extravasations. This discovery led to the suggestion that the man was suffering from apoplexy, and not from injury. He died during the following night, and the autopsy proved the correctness of the diagnosis. Both retinæ were extensively diseased; the urine contained in the bladder was loaded with albumen, and the kidneys were contracted and granular; the lateral ventricles of the brain were crammed with blood-clot. The man had not suffered from dropsy, and had kept at his work throughout.

38. *Graves' Disease.*—The following interesting clinical remarks were made by Dr. Reith on the occasion of a case of Graves' disease admitted into Aberdeen Royal Infirmary, and in which an opportunity was afforded for a post-mortem examination.

The singular triple combination of symptoms constituting Graves' disease is by no means an uncommon occurrence. Interesting as it is to the physiologist as well as to the pathologist, its nature has given rise to much discussion, inasmuch as the post-mortem examinations of patients affected with it have not tended to unveil the obscurity which surrounds it. When we reflect that the essential feature of the disease is the existence in the same individual of a triad of symptoms apparently unconnected with each other—namely, palpitation, enlargement of the thyroid gland, and protrusion of the eyes, we cannot be surprised at the great difference of opinion which prevails regarding its pathology. The difficulty is not diminished by the circumstance that, in some cases, one of the above symptoms is wanting, and that the affection occurs in stout as well as in anæmic persons. But whatever may be the primary cause, it is evident that those theories which refer the symptoms to anæmia and chlorosis, to pressure on the veins by the enlarged thyroid gland, or to venereal excess and disordered sexual function, are untenable, on the following grounds:—

1. Many of the patients are neither anæmic nor chlorotic; on the contrary, some are well-coloured, and even plethoric.
2. In not a few instances, especially in men, the thyroid gland is but slightly enlarged.
3. One of the three most prominent symptoms is often absent, or but slightly manifested. Thus there may be palpitation and goitre without proptosis, palpitation and proptosis without goitre, goitre and proptosis without palpitation.
4. The symptoms succeed each other in different orders in different individuals.
5. Patients affected with debilitating discharges are not subject to this disease.
6. The cardiac murmur at the base of the heart, when present, differs from that of anæmia.
7. Considering the rarity of the disease compared with the number of persons addicted to venereal excess, we can scarcely regard such excess as having any connection with it. There is, however, an undoubted relation between it and disturbance of the female sexual functions.

The opinion, first promulgated, I believe, by Trousseau, and now shared by Begbie, Fletcher, Laycock, etc., that the true cause of the disease is a neurosis of the cervical sympathetic nerve—is the one most consistent with our present physiological knowledge. The striking resemblance between the effects of artificial lesion of the sympathetic and the symptoms of Graves' disease fully justifies the inquiry as to the probability of a morbid lesion of the same nerve being the *fons et origo mali*. The connection of the sympathetic with the heart and the thyroid gland may be considered as satisfactorily demonstrated; and as excitement of the female sexual organs influences by reflex action through the ganglionic system, both the heart and the thyroid gland, there is ample reason for assuming that a lesion of that system itself would operate directly upon the organs connected with it. I am not aware that any post-mortem examination has yet thrown light upon the condition of the sympathetic in Graves' disease, and, consequently, Trousseau's opinion, however probable, requires confirmation. The case just recorded will therefore be of interest.

The case, it will be seen, differs somewhat from the usual appearance of Graves' disease. Instead of both eyes protruding at one time, there is an interval of a good many years between the protrusion of one eye and that of the other. Again, there is no history of palpitation. It should be remembered, however, that, when the patient was seen, his memory seemed entirely confused, and evidently could not be trusted, although, he was otherwise perfectly conscious of his condition. But whether palpitation existed or not, there can be no doubt that the case belongs to the same category as Graves' disease. There are some slight modifications, and its true place would probably be among the cases called "*fruste*" by the French. At the autopsy the various organs were found exactly as they have been found in Graves' disease—in a state of passive congestion. After a most careful dissection, nothing was found which would account for death except venous congestion of the viscera, and for this there was no apparent cause, unless we recognize as morbid the condition of the sympathetic. On the left side the trunk of the nerve and its two upper ganglia were considerably enlarged, while the inferior ganglion was not only enlarged, but hardened, so as to feel like cartilage. On the right side the nerve preserved its original appearance, but its inferior ganglion was in a similar condition to that of the left side. In addition the cellular tissue surrounding each inferior ganglion was thickened and hardened. Here, then, were alterations perceptible even to the unaided senses, sufficient, I believe, to account for the symptoms observed during life. For if we admit, with most physiologists, that the simple division of the cervical sympathetic is followed by a peculiar train of effects referable to the eye and the bloodvessels of the head, we must infer, also, that a morbid action in the same nerve will be followed by a corresponding train of symptoms. And this is what was observed in the present case. The trunk of the left nerve was enlarged, and the inferior ganglia of both sides presented such alterations that the whole substance of the nerve must have been implicated; and we can hardly suppose such to take place without serious interruption to its functions. The question then arises, What was the nature of this alteration? The microscopical appearances were far from decided, the only thing noteworthy being condensation of the ganglion cells, with an immense quantity of granular matter. It is thus very difficult to form a positive opinion. I have no doubt that the enlargement of the trunk and two upper ganglia on the left side was due to hyperæmia; but how it was induced is not at first sight clear. There was evident structural change in the inferior ganglia; but this had no special characters. Notwithstanding the apparent obscurity, I think we have sufficient data for a satisfactory, though I admit not conclusive, explanation. It is well known that syphilitic deposit may take place in the nerves and other tissues of the body of an albumino-fibroid description. This deposit, however, is not to be distinguished by its character from an ordinary inflammatory exudation, and the inference of syphilis can be drawn only from the presence of similar deposits in large quantities in other organs, the previous history, etc. In like manner a tuberculous deposit may occur, not distinguishable from an inflammatory exudation, and only assumed to be tubercular from the existence of undoubted tubercle elsewhere. This is what I believe took place in the above case. The ganglia were altered in structure, and the alteration presented no special character. When we consider, however, that there was extensive tubercular infiltration in the cellular tissue of the neck, that there was enlargement of the cervical glands, and that the neck from ear to ear was covered with scrofulous cicatrices, the assumption is warranted that the ganglia of the sympathetic were involved in a similar manner. There is no reason why the sympathetic nerve should not be subject to the same morbid lesions as other organs, producing effects proportional to the important part it plays in the economy, and I think that the explanation of the present case just given is, at least, fairly admissible. The nerves appear to have been involved by contact with the surrounding infiltrated tissue. This induced hyperæmia and then hypertrophy of the trunk above on the left side, and hyperæmia alone of the trunk on the right side, where the morbid action was evidently recent. The hypothesis just started receives confirmation from the condition of the sympathetic nerve and ganglia in various diseases. Rokitansky says, "There might, however, be a true hypertrophy of the ganglia, in aggregating of new ganglion cells; although of it also we lack proof from facts. I have met with a case of general emaciation combined with an eminent degree of hypochondriasis, in which the central abdominal ganglia were considerably enlarged." And again, "More important instances of hyperæmia are found in the sympathetic system; its central ganglia became congested in the course of general acute processes of low type (dyscrasisch), which become localized in those structures to which the ganglionic nerves are distributed, especially in the mucous membrane and follicular apparatus of the intestines. The congestions of the ganglia just mentioned in the early stages of ileo-typhus (typhoid), in the course of cholera and cholera-typhus are of this class." The same writer further states that exudations are not uncommon in nerves, these exudations involving the surrounding cellular tissue. The anatomical condition of the lower cervical ganglia and left sympathetic in this case, is quite analogous to Rokitansky's description, and may be set down to a low exudation, probably tubercular. This would lead us back to the blood as the ultimate cause of the disease, but it is probable that in all disorders depending on a constitutional diathesis, the blood and the vaso-motor system have a mutual action and reaction on each other, and that whether the one or the other be the primary seat of the morbid change, both come to be simultaneously affected. Begbie holds this view, but thinks that the *primum mobile* is the blood, at least in Graves' disease.

There is an apparent discrepancy in this case between the physiological and pathological results of lesion of the sympathetic. Section of the nerve causes falling in of the eye, contraction of the pupil, and dilatation of the bloodvessels; irritation of the nerve produces the opposite effects, protrusion of the eye, dilatation of the pupil, and contraction of the bloodvessels. In this patient there were two of the symptoms of irritation, proptosis and dilated pupil, with one of the symptoms of paralysis, dilatation of the bloodvessels. Belladonna exercises a similar action, causing dilated pupils (irritation), and enlargement of the bloodvessels (paralysis), although it is maintained that in the first instance the bloodvessels are contracted. Two explanations may be given of this anomaly. In the first place, the primary contraction of the bloodvessels caused by irritation of the nerve, as in the first action of belladonna, had been followed, according to the laws of stimuli, by an excessive reaction. Again, Brown-Séquard concludes, from observations made by himself, Bernard, and others, that there are two kinds of influence exerted by the sympathetic and the nervous system generally. By the one, when the sympathetic is excited the bloodvessels contract, and by the other they enlarge in consequence of a greater attraction for arterial blood developed in the tissues. Which of these two explanations is correct it is impossible at present to say. Claude Bernard endeavours to make out that there are two sets of fibres sent out from the oculo-spinal tract of the cord, one set, which he denominates oculo-pupillary, affecting the eye and the pupil, and the other, vascular calorific, specially affecting the bloodvessels, and that either set may be affected independently of the other. Reflex actions on the vaso-motor nerves cause a momentary contraction of the bloodvessels, which is followed by their dilatation. If these views be correct they may assist in throwing light on the subject, but it is evident that the cause of enlargement of the bloodvessels and consequent congestion is still obscure.

Various opinions have been entertained regarding the cause of the exophthalmos, but most writers consider it entirely the result of venous congestion and post-ocular serous effusion. This was the actual state of the right orbit in this case. But there was no such effusion, and much less congestion existed in the neighbourhood of the left eye, which was more prominent than the right. Supposing that the right eye had originally been protruded in consequence of congestion and serous effusion, it seems to me that, after the lapse of so many years, the eye would have recovered its original position in the absence of any mechanical perpetuating cause, as tumour, etc. Now, exophthalmos is often not present, or, if it is, not nearly to the same extent as here, in cases of extreme venous congestion, as in strangulation. While, therefore, congestion may assist in the production of exophthalmos, nervous influence must play a considerable part in the action, but how, has been hitherto unexplained.

Since the above was written I have seen an account of a discussion on Graves' disease in the *Société de Médecine* of Paris, recorded in the *Gazette des Hôpitaux* of March 21 and April 16, 1865. A case is mentioned where the sympathetic nerve was carefully examined. The lower cervical ganglia, especially on the right side, were much enlarged and reddened. Under the microscope the ganglionic structure was found almost obliterated, what remained of it being inclosed in the meshes of hypertrophied connective tissue, which composed the greater part of the ganglia. Predominance of the connective element and diminution of the nervous element constituted the alteration. For a full report of the case and the discussion I refer to the journal above mentioned.—*Med. Times & Gaz.*, Nov. 11, 1865.

39. *Black Cataract.*—Mr. Nunneley, of Leeds, showed to the Pathological Society (Nov. 21, 1865) a specimen of this. The patient, 75 years of age had had double catract. Nothing unusual had been observed in the case. The right lens, which had been the longer affected, was extracted January 19, 1865. It was then quite black at the centre, and nearly so at the margin, but it had become of a lighter colour by keeping. The other lens was extracted in February, and was of a lighter colour, and also was of a lower specific gravity.—*Med. Times and Gaz.*, Dec. 2, 1865.

MIDWIFERY.

40. *Mortality of the Childbed as affected by the Number of the Labour.*—The *Edinburgh Medical Journal* for September last contains an interesting paper on this subject by Dr. J. Matthews Duncan. The author, after presenting the statistics he has collected, remarks, "It must be noted that I have, hitherto, at least, said nothing regarding the nature of the relation between the number of the delivery and the mortality attending it. It is true the data recorded demonstrate more or less completely certain coincidences, which may be called laws. But they establish nothing further. These laws are as follows:—

"1. The mortality of first labours is about twice the mortality of all subsequent labours taken together.

"2. The mortality from puerperal fever following first labours is about twice the mortality from puerperal fever following all subsequent labours taken together.

"3. As the number of a woman's labour increases above nine, the risk of death following labour increases with the number.

"4. As the number of a woman's labour increases above nine, the risk of death from puerperal fever following labour increases with the number.

"5. If a woman has a large family, she escapes extraordinary risk in surviving her first labour, to come again into extraordinary and increasing risk as she bears her ninth and subsequent children.

"These laws, although they merely state coincidences, have very important practical bearings, which are too self-evident to require description. They have also important philosophical bearings, which were alluded to in the commencement of this article. The most important, perhaps, of these relate to puerperal fever. These also I shall not enter upon farther than to say, that the attendance of puerperal fever specially on primiparæ, and women who have born large families—its pretty close correspondence in relative amount to the general mortality of parturition after different pregnancies—its subjection also to the law of the duration of labour—do not appear to me no lend support to the views hitherto generally entertained regarding it, and expressed in the words accidental fever, contagious, epidemic. Another point under this head I shall merely mention. Authors, comparing the mortalities of lying-in institutions, whether from puerperal fever or from other causes, are frequently found neglecting to begin by ascertaining whether or not they are fit objects of comparison, and under this head, *inter alia*, neglecting to ascertain the comparative amount of primiparity in each institution. It is plain that, unless there be nearly the same comparative amount of primiparity in the institutions, their respective gross mortalities cannot be justly compared with one another."

41. *Fatal Case of Accidental Hemorrhage.*—Dr. YOUNG read the following case of this to the Obstetrical Society of Edinburgh (26 April, 1865), which we lay before our readers, with a report of the interesting and instructive discussion to which it gave rise:—

"Mrs. A., æt. 40 or 41, was rather of a corpulent habit, and had long enjoyed excellent health. I was called to visit her at 6 A. M. on the 22d February, when I found that about a pint of blood had escaped in the chamber utensil, and a considerable quantity in the bed. On examination, I had some difficulty in even discovering the os uteri, and found some exertion necessary in the introduction of one finger, it being almost of cartilaginous firmness, and so far from the cervix being thin, the length of this callous canal could not be less than one inch. She has felt no pains. She was only in the eighth month of pregnancy, or rather had not completed the eighth month.

"After remaining with her for about an hour, I ruptured the membranes with a blunt-pointed probe, about nine inches long, and encased in a small-sized male catheter made straight, having the farther end open, which I had formerly employed for the purpose of inducing premature labour till a safer and better method was introduced. I had previously tried to rupture the membranes in the present case with a pointed piece of whalebone, but found that the membranes yielded before it, as they not unfrequently do when firm and not distended by pain. No good resulted from the rupture; and finding the hemorrhage continuing, and the os uteri as rigid and undilatable as at first, I introduced into the os a sponge-tent, but which, after remaining a considerable time, produced no effect in dilating it. Finding the hemorrhage rather increasing than otherwise, and the utter hopelessness of dilating the os, and the patient's strength giving way, I considered it necessary to have the advice and assistance of Professor Simpson, but who being unable from indisposition to leave his own house, kindly sent Dr. Alexander Simpson. After mature consideration of the whole circumstances, and after making a farther trial of larger sponge-tents, he agreed with me in thinking that the only chance of life for the patient was to make two lateral incisions through the os and cervix of the uterus; this was done about 10 A. M., after which I had little difficulty in gradually, and as gently as possible, dilating the os and introducing the hand, and effecting delivery by turning. There being, however, still too much discharge, we injected iced water into the uterus, which had the effect of greatly modifying the discharge. The pulse being weaker and the patient faint, the supply of wine was continued; and by noon, when we left, she had considerably recovered, but complained of pain, though not severe, in the left iliac region.

"Dr. Simpson saw her again with me at 2 P. M., and found her going on well, the pain not severe, and the pulse 110. She continued to progress favourably till the third day after delivery, when the pulse rose to 120, and the pain had increased, with a slightly tympanic condition of the abdomen. She had already taken a considerable quantity of opium, with small doses of calomel, fomentations, of hot water; poultices with turpentine were also employed. She was ordered nutritious soup, and next day wine. She died on the fifth day.

"*Post-mortem examination thirty hours after death*, conducted by Dr. Jolley, demonstrator of anatomy, who remarks as follows: 'Abdomen very tympanitic. Adipose matter to the depth of an inch and a-half. On opening abdomen intestines found enormously distended with flatus. There was no effusion into peritoneal cavity, and no signs of peritonitis, with the exception of slight injection of the recto-vesical pouch.

"'*Uterus.*—No adhesions. Normal in appearance externally; perfectly free and movable in pelvis; the os and cervix had been laterally incised on the left side to the extent of an inch. The mucous membrane of cervix had a slightly dark sloughy appearance; other organs not examined. The post-mortem examination revealed no evident cause of death. No inflammation visible in any organ in the abdomen. On one spot of the colon, about the size of a shilling, there appeared a little coagulable lymph. Two fibrous tumours existed in the uterus, evidently of long standing, about the size of a nut, one on the anterior wall of the uterus, and one behind. The incision of the os and cervix, and increase of the aperture by a slight tear, did not extend beyond the junction of the cervix with the upper part of the vagina.'

"Hemorrhage, whether accidental or unavoidable, is always a source of anxiety to the practitioner, and sometimes occasions no small amount of perplexity. It is, to say the least, a grave occurrence. Knowing as we do that unless checked a majority will die undelivered, and I know few more painful positions in which an accoucheur can be placed than when his patient dies undelivered. I have no doubt that one principal cause of fatality is unjustifiable delay, there being often great reluctance to a 'forced' delivery, where the os uteri is in an undilated state, even though soft and yielding, which fortunately is the case in most instances, especially after the first birth. The usual advice in works on midwifery is to wait till the os has assumed a condition favourable for the introduction of the hand. And certainly there is not in general much difficulty in effecting this in cases of severe hemorrhage; but it does occasionally happen that the os, notwithstanding the flooding, and that even in a second or third child, is so firm as to require the continued exertion of the practitioner, especially if the labour is premature. In such cases the probability is, that the undeveloped condition of the cervix is as much to blame as the rigidity of the os.

"Smellie gives three cases where he found it impossible to dilate the os uteri without extensive tearing, and adds, 'by this it appears how difficult it is to dilate this part in women going of a first child, especially when they are pretty old; indeed, it is sometimes impossible to be done before they come to their full time, and even then not till the parts are soft and thin.'

"Plugging the os or vagina, or both, in order to arrest the flooding, is, to say the least, a very doubtful practice. Merriman thinks it inapplicable after the first five months of pregnancy; and for this reason, that the parietes of the uterus, especially after the sixth or seventh month, are so easy of distension as to yield readily to the accumulation within, and thus the blood may collect and increase in the cavity of the uterus till a fatal termination takes place; for, as justly remarked by Ramsbotham—(I cannot help taking this opportunity of saying how much the profession is indebted to Dr. Simpson for the introduction of sponge-tents for the os uteri, so useful and important in many cases, not only of diseases of the uterus, but also of abortions attended with much loss of blood)—'This reasoning is undoubtedly true to its fullest extent in accidental hemorrhage before delivery under retention of the placenta, and in flooding after its expulsion; for, as the blood concretes within that organ, the viscus is more and more distended, its vessels become more dilated, their orifices gape wider and wider, and consequently rendered capable of pouring out a larger quantity of blood in a given time. These remarks,' he adds, 'are not intended to apply to unavoidable hemorrhage; other objections apply to the use of the plug, especially when near the full period of pregnancy.'

"*Rupture of the Membranes.*—Denman. Rigby, Merriman, Blundel, Davis, Conquest, Ingleby, all advocate this practice. Among others, one good result may be, that in consequence of the cavity of the uterus being lessened, the uterine vessels are less likely to continue bleeding, so violently at least. The probability of a farther separation of the placenta to any great extent is lessened, and the partial contraction of the muscular coat of the uterus is likely to diminish the size of the open mouths of the bleeding vessels; besides all this, it is calculated to promote regular labour-pains.

"Dr. ALEXANDER R. SIMPSON said, that he had shown the placenta in this case at a previous meeting of the society. The members would recollect that there were several points where extravasation had taken place at different times. There was one of a pale colour, another more recent, of a darker hue, and a large one from which the fatal hemorrhage had taken place. The incision of the os, as described above, was the only chance of remedy. There was no unusual discharge from the incision.

"Dr. MOIR remarked that in cases of accidental hemorrhage he never recommended the rupturing of the membranes. The best treatment he considered was to turn the child, and deliver as soon as possible. Many years ago he had a similar case to the present one. There was profuse hemorrhage, and the woman was rapidly sinking. The os was firm, and admitted only one finger, but by tilting up the head and external manipulation he succeeded in laying hold of a foot. The os dilated to the body of the child, and he thus succeeded in saving the patient. Rupture of the membranes he considered useful only where the back of the child was towards the placenta, when it might then act mechanically by pressure on that organ. In other cases it does not stop the hemorrhage, and greatly increases the difficulty of turning the child.

"Dr. BURN remarked that he had had a number of cases of accidental hemorrhage; he invariably ruptured the membranes, and he did not recollect a single case where it did not restrain the hemorrhage.

"Professor SIMPSON stated that in his lectures he recommended rupture of the membranes for accidental hemorrhage. The question was, where does the blood come from? He believed it escaped from the line of junction between the attached and the detached portions of the placenta. By rupturing the membranes, and thus lessening the contents of the uterus, you put this line off the stretch, and thus restrain the bleeding. This mode of procedure often succeeded. Rupture of the membranes, however, no doubt increased the difficulty of turning. He had performed incision of the os two or three times, one case of which he had published, where, by means of it, he had saved both mother and child. Laceration of the os was known frequently to take place during labour, and especially with turning before the os was fully dilated. He had heard of a case lately where tetanus had followed, but this was extremely rare. In cases of unavoidable hemorrhage, he had lately had a new question suggested to him. He had been called to see a lady who had had severe and frequent attacks of hemorrhage during pregnancy, due to placenta prævia. She was now much exhausted from loss of blood; and the question was, whether premature labour should not be induced? There was small probability of saving the child; and should the risk of the patient's life be run by the repetition of these hemorrhages? He had lately found that a practice had got abroad of turning in cases of unavoidable hemorrhage, immediately after the placenta had been removed in the manner recommended by him. This he considered bad practice. It was submitting the patient, exhausted by loss of blood, to the risks of a double operation, and the probability of thus saving the child was very small, while the danger to the mother was great. In some cases, where the presentation was abnormal, it could not be helped; but where the presentation did not necessitate it, he considered it bad practice to interfere further with labour.

"Dr. MOIR remarked that there was a point in reference to post-partum hemorrhage which he had not seen referred to in books. Dr. Hamilton used to state, that when a patient complained after delivery of a constant severe pain in the back, he always found that internal hemorrhage had taken place. In practice, he (Dr. M.) had also always found it the case.

"Dr. BRYCE stated that he had had several patients who flooded in this manner after each delivery, and they always complained of this constant pain, but in his cases it was situated in front. He found it was never safe to leave these patients until the normal recurrent after-pains had come on.

"Dr. PATTISON and Dr. ZIEGLER both related cases where internal hemorrhage had taken place after more than an hour after delivery; both patient's complained of intense pain in the back. It was from this symptom that they had been again summoned to the patients."—*Edinburgh Medical Journal*, October, 1865.

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42. *Rupture of the Uterus; Abdominal Section; Subsequent Pregnancies.*—Dr. S. S. DYER records (*British Medical Journal*, Sept. 9, 1865) a remarkable case of this. The patient was a pauper, 37 years of age, in her fourth pregnancy. The three previous labours had been natural. Mr. Clifton, who first saw the patient, gave the following history: "He had been called this day [July 29, 1862], at six o'clock in the morning, when he found the os uteri about the

size of a shilling. The presentation was natural; the pains trifling and ineffectual. He waited two hours; and, as no progress was being made, he gave a dose of ergot, and continued in attendance another hour. But no increase of pains in force or frequency took place; and he left for his surgery and to see other patients, promising to return; and said that, if wanted before doing so, he was to be sent for. He heard no more of the case until afternoon, and then drove down to Mockbeggar, taking his forceps with him. He was then told that no pains of any consequence had come on till the middle of the day, since which they had been steadily increasing in force and frequency. The os was now fully dilated, and the head at the brim of the pelvis. He went down stairs, determining to give more time for the natural termination of a case which now seemed to be going on favourably, leaving two female neighbours with the patient. In about an hour he was called hastily, and found the woman fainting, blood issuing from the vagina; the head higher than it had been, and rapidly receding. The bystanders said that there had been a violent pain, during which they heard a noise as if something had given way."

When seen by Dr. D. at eight o'clock in the evening the patient was "in a state of great prostration, and evincing signs of severe shock to the nervous system. She was quite sensible; the pulse was quick and fluttering; the breathing short and hurried; the skin cold, and covered with perspiration, which stood in large drops on her face and forehead. On placing the hand on the abdomen, which was very tender, the outline of a fœtus could be distinctly felt lying beneath the parietes; the uterus, contracted to the size of the fœtal head, was evident; and on examination *per vaginam*, it was clear that the uterus was emptied of what it contained."

On consultation it was decided to resort to gastrotomy. In consequence of delay in obtaining instruments and chloroform, the operation was not performed until 4½ hours after the rupture had taken place. The patient recovered most favourably.

On the 9th of Aug. 1863, Dr. D. attended her in a miscarriage and again on the 11th of June, 1864. On the 23d of July, 1865, she was delivered by Dr. D. of a fine living male child, and she made a rapid convalescence.

43. *Extra-Uterine Fœtation.*—Dr. J. Braxton Hicks read before the Obstetrical Society of London a case of this in which he had detected a fœtus alive in the recto-vaginal pouch of peritoneum. Considering its advance to maturity in that position highly dangerous throughout its development and after, he endeavoured to arrest its growth by powerful galvanic currents. This was repeated without effect. It was then determined to pass a trocar into the fœtus, which was done per vaginam readily without any bleeding. The fœtal movements ceased next day; but vomiting, partly from the chloroform given, continued very violent till about the fifth day, when, sudden collapse supervening, the patient died on the sixth day after the operation. The post-mortem examination showed that hemorrhage was the immediate cause of death, owing to slight separation of the upper part of placental attachment to the exterior of the uterus, but none whatever occurred at the seat of puncture. The examination also showed a curious fact—namely, that the cyst in which the fœtus originally was formed had ruptured, and that the ovum entire had escaped into the recto-vaginal pouch, and continued to live and grow, the ovular membranes filling entirely the pouch, the placenta being attached to the back of the uterus. On opening the original cyst from above, the ovular membranes were seen through the rupture in the cyst. Dr. Hicks having requested the assistance of the President in elucidating these points, and in giving a report, the report was then read, confirming the above facts, and endeavouring to explain the mode of occurrence.—*Med. Times & Gaz.*, Nov. 11, 1865.

44. *Intra-Uterine Variola.*—M. Legros presented to the Biological Society of Paris a variolous fœtus, with the following history: On May 18th, a woman in the Hôtel Dieu was prematurely delivered of a fœtus aged apparently about five months, which was covered with pustules of smallpox. The mother had distinct marks of vaccination, and had never had smallpox. About six months

previously, she had had connection with a man who was convalescent from variola. No exposure of the mother to contagion could be traced. This case, M. Legros observed, raised the question whether the father could have communicated the smallpox at the moment of fecundation, the disease remaining for five months in a state of latency. This theory he believes to be supported by the facts that, when a pregnant woman has smallpox, the fœtus is sometimes not attacked till some time after the recovery of the mother; and that, in a child of a syphilitic father, the disease in some cases does not show itself in the infant until several days or even weeks after birth.—*Gazette Méd. de Paris*, Aug. 5, 1865.

45. *Retention of Urine in the Fœtus.*—M. Depaul related to the Société de Biologie a case in which a woman was delivered of an eight months' child presenting a great enlargement of the abdomen; there was very little amniotic fluid. The child died soon after being born. The bladder was about 4½ inches long and 2¾ wide, and was full of urine. The ureters were also irregularly enlarged, resembling at first sight the intestinal convolutions; and contained urine. The kidneys, especially the left, were also much distended; they were transformed into cysts with thin walls, filled also with urine. The cause of this distension was found to be an imperforate state of the urethra, at the junction of the muscular and prostatic portions. More than a pint of urine was removed. —*Gaz. Méd. de Paris*, July 15, 1865.

HYGIENE.

46. *Ozone.*—Dr. B. W. Richardson, in a paper read before the British Association for the advancement of science at its late meeting, observed that the following are the reliable facts known up to this time respecting ozone. 1. Ozone in a natural state is always present in the air in minute proportions; viz., one part in ten thousand. 2. It is destroyed in large towns, and with special rapidity in crowded, close, and filthy localities. 3. Ozone gives to oxygen properties which enable it to support life. In this respect it acts like heat; its effects are destroyed by great heat. 4. Ozone diffused through air in minute quantities produces, on inhalation, distinct symptoms of acute catarrh. 5. When animals are subjected to ozone in large quantities, the symptoms produced, at a temperature of 75°, are those of inflammation of the throat and mucous membranes generally, and at last congestive bronchitis, which in carnivorous animals are often rapidly fatal. 6. When animals are subjected for a long period to ozone in small proportions, the agent acts differently, according to the animal. The carnivora die, after some hours, from disorganization of the blood separation; but the herbivora will live for weeks, and will suffer from no acute disease. 7. The question whether the presence of ozone in the air can produce actual disease, must be answered cautiously. Science has yet no actual *demonstrative* evidence on the point. But the facts approach to demonstration that catarrh is induced by this agent. All else is as yet speculative. 8. During periods of intense heat of weather, the ozone loses its active power. 9. On dead organic matter undergoing putrefaction, ozone acts rapidly; it entirely deodorizes by breaking up the ammoniacal products of decomposition. At the same time, it hastens the organic destruction. 10. There is an opposite condition of air in which the oxygen is rendered negative in its action, as compared with the air when it is charged with ozone. Air can thus be rendered negative by merely subjecting it, over and over again, to animals for respiration. The purification of such air from carbonic acid and other tangible impurities, does not render it capable of supporting healthy life; but ozone restores the power. In a negative condition of air, the purification of the organic matter is greatly modified, and the offensive products are increased. Wounds become unhealthy,

and heal slowly in such negative air. 11. There is no demonstrative evidence, as yet, that any diseases are actually caused by this negative condition of air; but the inference is fair—that diseases which show a putrefactive tendency are influenced injuriously by a negative condition of the oxygen of the air. It is also probable that during this state decomposing organic poisonous matters become more injurious. 12. As ozone is used up in crowded localities, and as it is essential that ozone should be constantly supplied in order to sustain the removal of decomposing substances and their products, no mere attention to ventilation and other mechanical measures of a sanitary kind can be fully effective, unless the air introduced be made active by ozone. Fever hospitals and other large buildings in towns should be artificially fed with ozonized air.—*Brit. Med. Journ.*, Oct. 7, 1865.

47. *On the Effects of Scanty and Deficient Food.*—Dr. John Davy, in a paper read at the September meeting of the British Association, commenced by stating that although it is generally believed that health suffers and the constitution is impaired by scanty supply of food, he had good reason to believe that this impression is unnecessarily exaggerated. He had failed to discover to his own satisfaction that an insufficient supply of food created disease, and quoted the experience of many great travellers in Africa, and also of some connected with the Arctic expedition, to show that in great privations and a temporary loss of sustenance, the constitution was not permanently injured in consequence. In fact, Dr. Davy went so far as to say that occasional abstinence from food was likely to prove more beneficial than otherwise. He referred to those tribes of people whose supply of sustenance is precarious, and averred that no particular form of disease was contracted by their not being able to obtain what might be considered a proper quantity of food with regularity. He admitted that such tribes and people are often below the average standard in height and weight, but still maintained that they did not materially suffer in health in consequence of their occasional fasts. The same thing was observable in people of all ages. The persons who had been remarkable for longevity were invariably to be found among the poorer class of people, and were consequently not among those who fared the most sumptuously, or who, even in regard to the quantity, took a large amount of food. Dr. Davy drew attention to the fact that the Irish people suffer more from the scarcity of provisions than we in England, and had been subject to famines almost unknown to us, yet the average longevity in Ireland was greater than in this country. His remarks also applied to animals, and he instanced that cattle which were not overfed were the healthiest, and that the Welsh sheep that obtained their sustenance from the scanty herbage that grows upon the mountains, were not worse than sheep better fed. Dr. Davy referred to that class of people, such as the poor needle-women, among whom the mortality is great, but asserted that this was not owing to the poor supply of food, but rather to bad ventilation, sedentary habits, and other causes. His remarks were, however, principally urged against the present prison dietary system. He stated that our criminals were unnecessarily well fed, owing to the prevalent impression that too little food was dangerous to health, and he endeavoured to prove that a lower scale of diet would not be followed by any dangerous results to the constitution of the criminal. In fact, his remarks went to show that philanthropy in this direction had been carried too far, and by quoting the scale of diet given at various prisons he endeavoured to show that criminals were rather overfed than underfed.—*Med. Times and Gaz.*, Sept. 23, 1865.

48. *Is the Opinion that a Diet of Animal Food Conduces to Leanness well Founded on Facts?*—In a communication presented to the British Association in September last, Dr. John Davy said those who have advocated the opinion that a diet of animal food conduced to leanness had supported it by arguing that a vegetable diet was commonly richer than flesh in the elements from which adipose matter is formed, such as starch, etc., and further, that carnivorous animals were commonly leaner than herbivorous. He disregarded the first argument, inasmuch as certain kinds of animal food abounded in fatty matter. He instanced the case of animals subsisting on other animals, all of which

were very fat, and he considered that tended to show that a diet of exclusively animal food was in no wise incompatible with fatness. Referring to our own species, it was easy to find corroborative instances. Butchers and their families, who used large quantities of meat, were not remarkable for leanness; and fishermen and their families were generally stout. The English, as a rule, had always been considered large consumers of meat, especially in the olden time, when vegetables were less abundant; and in those periods they were notorious for their stoutness. Did a vegetable diet tend to the production of fat? The Irish, living mostly on potatoes, should be distinguished for lustiness, though they certainly were not; and he had not heard fatness ascribed to vegetarians. Amongst our soldiers and sailors a fat man was a rarity; but that was no wonder, for though their diet contained a large proportion of animal matter, their meat ration was never an excess, and they were rather underfed than overfed; while at the same time they had a great deal of exercise. His opinion, in which he was supported by eminent physiologists, was that a mixed diet, partly animal, partly vegetable, was best adapted to the wants of man, as well as most suitable to his taste; and that the safest way to avoid obesity was to live moderately, observing the happy medium between a too sparing and a too copious dietary; and, for the correction of obesity, attending rather to quantity than quality of food.

49. *Beef and Pork as Sources of Entozoa.*—Dr. COBBOLD, in a communication read before the British Association at its meeting in September last, referred to the general impression that the common pig was the principal source of entozoa. He asserted that birds and all animals of warm blood were liable to breed parasitic disease, and stated that, in spite of all preconceived notions, the human system was the home of at least two sorts of entozoa. He combated the popular idea that tapeworm was principally derived from measly pork, and asserted that the disease was as often contracted from eating beef and veal. He showed, too, that animals containing parasites did not always display unhealthy symptoms, therefore it was difficult to detect the disease, and asserted that persons who ate moderately of infected meat were liable to be affected with tapeworm. Young animals were less liable to have the disease, and persons eating their food always well cooked were most likely to escape any bad effects. In fact, eating meat always well cooked, and never under-done, was the only sure preventive. Dr. Cobbold, by the aid of diagrams, showed the different kinds of tænia, and stated that the hookless tænia was to be found generally in beef, and the hooked tænia in pork.—*Med. Times & Gaz.*, Sept. 23, 1865.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Report of an Exsection of two and one-half inches of the Right Tibia; Recovery. By W. Kempster, M. D., of Syracuse, N. Y.

Private Alfred Lynn, Co. F, 47th Regt. Pa. Vols., aged 18, German, was wounded at the Battle of Cedar Creek, Va., Oct. 19th, 1864, by a ball which struck the right leg, near the junction of the middle with the lower third posteriorly, and passed directly through, shattering the tibia.

On admission to the hospital (Oct. 23d), he complained of intense pain in his leg, and great weakness; the wound of exit presented a ragged appearance; several large pieces of bone protruded, but they were not detached from the shaft; the fibula was uninjured. He stated that the wound bled profusely at first, and his appearance indicated that he had lost considerable blood; hence it was inferred that the posterior tibial artery had been injured. It was decided that as soon as the patient had gained sufficient strength, or in the event of hemorrhage, the leg should be amputated; in the mean time it was put upon hair pillows, and dressed with oakum, the wounds being occasionally washed with a weak solution of permanganate of potash.

Eight days after admission, the patient having improved in health and spirits, it was decided to amputate the limb; but he strenuously objected, and declared that he would rather die than lose his leg.

Exsection presented the only alternative; he expressed himself willing to undergo any operation short of amputation.

The patient having been brought under the influence of chloroform, an incision four inches long was made, over the spine of the tibia, running through the wound of exit, and down to the bone, which was found extensively comminuted for a distance of two inches; the spiculæ were connected with the upper portion of the shaft; these were detached, and the upper and lower portions of the tibia cut smooth with Liston's forceps; the parts then had the relation to each other of an oblique fracture, with the loss of two and one-half inches of bony structure; the edges of the wound were brought together, and maintained by sutures, and the leg placed in an easy position on pillows. The patient bore the operation well; there was but little hemorrhage.

Nov. 10. Wound looks well, granulations healthy; general health good.

25*th*. A hard tumour can be felt occupying the space made by the exsection, and enveloping both ends of the broken shaft; the wound is discharging laudable pus, and is healing rapidly.

Dec. 11. The tumour, which is evidently callous, is larger, a nodulated border can be felt, corresponding to the spine of the tibia.

30*th*. Upon grasping the upper and lower fragments, and endeavouring to move them, no motion can be felt; the callous retains its size; the patient was allowed to leave his bed to-day for the first time.

From this period the case progressed slowly but favourably; the wound of exit alternately closing and opening; the callous grew gradually smaller, giving the leg a natural appearance; in March, 1865, he could put his foot to the floor, and bear about fifty pounds upon it; in May, he was able to walk short distances, by favouring it slightly; both wounds had healed.

It was with many misgivings as to the probable result that we performed the operation; and it is our belief that the favourable issue was in great measure due to the *perfect quiet enjoined;* the patient was not allowed to leave his bed for two months; and the foot did not touch the floor under three and one-half months.

Since the above operation was performed we have met with two other cases of the same kind; in one, three inches of the bone were removed; in the other, not quite two inches; both were the result of gunshot wounds, both were in the continuity of the bone, and both recovered with serviceable limbs.

It is to be regretted that this operation has not claimed the attention it deserves. We are fully persuaded of the importance of exsection in the upper extremities, and, should a similar case occur in the course of our practice, it would be treated like the above.

It is a source of disappointment that we had not tried this operation before, believing that some useful limbs might have been saved; but having heard the operation of exsection of the lower extremities denounced *in toto* by our seniors, it is not surprising that we also should entertain similar views, until compelled to relinquish them by force of circumstances.

Case of Paralysis of the Median Nerve. By J. W. MOORMAN, M.D., of Hardinsburg, Kentucky.

I was called on the night of the 15th of September to see a farmer, aged about thirty-eight years. He had been ill for several days with fever of a remittent type, for which a neighbouring practitioner prescribed sulphate of quinia in large doses.

Six hours before I arrived he had, while delirious, fallen from a door some four feet high on a pile of stones. I found him easy except the pain from a few slight wounds of face and neck incurred in falling. Along the whole length of both arms there was a numb dead feeling, or rather want of feeling, and almost total incapacity of motion. Arms cold, pulse at radial artery weak and slow, bowels torpid.

On examination of spinal column, found space over sixth and seventh cervical vertebræ much bruised and very sore. The case I diagnosed to be one of concussion of spine. Ordered calomel and rhei, āā gr. v, to be followed in four hours by a full dose of castor oil and turpentine. Antiphlogistic regimen for several days.

Sept. 20. Patient is up. Still has numbness in his arms, can use them slightly; considerable soreness over cervical region; no febrile symptoms; appetite good, bowels regular. ℞.—Quin. sulph. gr. xl, morphia sulph. gr. iv, strychnia gr. j. M. ft. pil. no. xxx. S. One three times a day. Apply blister, four by six inches, over cervical region.

25*th.* No unnatural feeling in left arm, pain in right arm along the line of the median nerve, complete loss of motion in right thumb. Still some soreness over cervical vertebra. Appetite good; suffering some with diarrhœa. ℞.—Linimentum ℥ij; tr. arnica, tr. nux vomica, āā ʒj. M. ft. liniment., to be rubbed along the line of the pain; continue use of the strychnia; apply second blister higher upon neck.

30*th.* Very little soreness; pain in right arm continues; considerable irritation of bowels; twitching of muscles. Ordered opium and sulphate zinc for the diarrhœa. Discontinue strychnia. Continue liniment.

Oct. 5. Improving; can use arm in ordinary labour; experiences considerable difficulty in moving thumb. Still continues the use of liniment, and thinks he will need nothing more.

In this case, while the injury is apparently confined to origin of the outer cord of the brachial plexus of nerves, the median arising by slips from both cords, is most affected, while the musculo-cutaneous, the continuation of the outer cord, remains intact. Further down the digital branches given off to the thumb are seriously affected, while those given off from the same point to the fingers remain unaffected. There was doubtless inflammation of a chronic character affecting the spinal cord, and as a consequent effusion and thickening of its membranes rendering slight compression inevitable, yet why the whole plexus was not involved equally, and why at the distal extremity branches given off at the same part differ so materially—some seriously affected, others remaining perfectly intact—remains yet to be explained.

Sycosis cured by Sulphite of Soda. By J. Y. Dale, M. D., Agricultural College, Pa.

In August, 1865, I was consulted by T. W., aged 23, a returned soldier, who had *sycosis menti*, which extended over his chin and the left side of his face. Having read of the influence of sulphite of soda on diseases of cryptogamic origin, it occurred to me that this would be a very good case in which to try its effects. I therefore prescribed for him as a local application sodæ sulphis gr. xl, aquæ ʒij, glycerinæ ℥j, M., which was to be used frequently; and I directed him to keep his beard closely trimmed, but not to shave. In four days not a vestige of the eruption remained. The same remedy has proved equally effectual in three cases treated since then.

DOMESTIC SUMMARY.

Dermoid Tumour of the Conjunctiva.—Dr. F. P. Sprague records (*Boston Med. and Surg. Journ.*, Dec. 11, 1865) a case of this in a girl, eight years of age. The tumour was congenital, was situated one-third on the cornea and two-thirds on the sclerotica, and had hairs growing from it. The tumour was excised.

Dr. S. states that he has been "induced to report this case from the impression that these little tumours are quite rare. On looking over several authors, I could find no mention of them till I took up *Wecker on Diseases of the Eye*, a work now issuing from the French press. Wecker seems to have carefully collected all the observations on the subject, which, however, are few in number. He mentions only one case as seen by himself."

Dr. Sprague's investigations seem not to have been very carefully made; at all events, he has *overlooked* examples which were *near at hand.*

A similar case of a young lady, in which a tumour existed on each eye, was described, and figures given of the tumours by Dr. Taliaferro, of Cincinnati, in the No. of this Journal for July, 1841.

Mr. Lawrence, in his learned treatise on the diseases of the eye (see edition published by Blanchard & Lea in 1854, p. 341 *et seq.*)—a work which our Boston brethren seem to be entirely unacquainted with—refers to similar cases described by Wardrop, Mackenzie, Himly, Graefe (the elder), and Ammon. A case is recorded by Mr. W. White Cooper in *London Med. Gaz.*, Nov. 1841.

Mr. Tyrrell also has described and delineated (*Practical Work on the Diseases of the Eye*, vol. i. pl. 8, fig. 4) two small tumours of this kind, but without hairs.

All these cases will be found noticed in the edition of Mr. Lawrence's work referred to.

Experimental Investigations into the Action of the Bromide of Potassium.—This is the title of a very interesting paper by Dr. ROBERTS BARTHOLOW, in the November number of the *Cincinnati Lancet and Observer.* The author's investigations were conducted in three directions: 1st, the chemical properties; 2d, the physiological effects; and 3d the therapeutical uses of the salt.

The physiological effects of the article when taken into the stomach Dr. B. sums up as follows:—

"1. It proves irritant in large doses to the mucous membrane of the stomach.

"2. It is rapidly absorbed into the blood, and may be detected soon after in the urine.

"3. It acts upon the nervous centres, producing sedation, sleep, reduces the action of the heart and arteries, lowers the temperature, and diminishes the retrograde metamorphosis of tissue."

The prolonged administration of the bromide of potassium produces according to Dr. B., the following effects:—

"1st. It diminishes and ultimately entirely neutralizes the sexual appetite.

"2d. It produces weakness of the muscular system.

"3d. It is irritant to the stomach if given in considerable doses, and

"4th. It interferes with the secondary assimilation, lessening the retrograde metamorphosis of tissue."

In regard to its therapeutical uses Dr. B. extols it as a *disinfectant* and *deodorizer*, as an *escharotic* in sloughing and gangrenous ulcer, phagedenic chancres, hospital gangrene, epithelioma, &c.

"The actions of the bromide of potassium physiologically considered," Dr. B. states, "consist in a sedative or contra-stimulant effect upon the nervous centres, producing as secondary phenomena, sedation of the heart, anæmia of the brain, anaphrodisiac effects and diminution of the retrograde metamorphosis of tissue. It has come into use in various functional and organic nervous disorders, and in certain sexual diseases, where a calmative and sedative influence is desired."

This article Dr. B. considers to be indicated as a hypnotic in states of nervous excitement without congestion of the nervous centres; in hysterical insomnia; in delirium tremens; in the insomnia of excitable business men, or, in general terms, in those forms of insomnia dependent upon excitation without increased blood supply. Dr. B. has found it especially useful in irritable bladder, and the chordee of gleet. We have several times prescribed ourselves with benefit in these conditions.

For a careful survey of all the facts Dr. B. gives the following as the *methodus medendi* of the salt in question:—

"1st. The bromide of potassium acts by absorption into the blood.

"2d. Its effects are expended upon the nervous centres, or the cerebro-spinal axis.

"3d. Sedation of the heart and circulation, and the various local sedative effects are secondary results of the impression made upon the nervous centres.

"4th. Its physiological effects are not very decided, and are easily modified by any local disturbance.

"5th. Its therapeutical action is still more decidedly influenced by local morbid processes.

"6th. It is indicated where a sedative to the nervous system is required—in insomnia; too great reflex excitability; nervous and spasmodic affections of the larynx and bronchi-sexual excitement, and in an irritable state of the sexual organs.

"7th. It will be effectual in the foregoing conditions, in proportion to the degree in which structural lesions are absent, or in other words, in proportion to the degree in which these morbid states are functional rather than organic."

The bromide, Dr. B. asserts, possesses none of the peculiar alterant property of the iodide. Whilst this fact is true, it is undoubtedly the case that the bromide relieves congestion of certain organs, diminishes their bulk, or, as it may be styled, produces resolution of an engorgement. Such action, apparently alterative or resolvent, is not really so. It has been exhibited mainly in certain states of the uterus and ovaries—states of hyperæmia dependent upon sexual excitement, or upon the monthly nisus. The apparent resolvent power is, in this case, due to the sedative impression of the remedy upon the sexual organs and upon the vaso-motor nerves.

—

Treatment of a certain form of Paralysis occurring in Children.—Dr. Wm. A. Hammond relates (*New York Medical Journal*, December, 1865) three cases of that form of paralysis "consisting essentially of fatty atrophy of the muscles" successfully treated by the continuous galvanic current.

The first case was a boy five years of age who came under Dr. H.'s care "April 19, 1865, to be treated for paralysis of both lower extremities. During the previous summer the child had suffered from hooping-cough, and when the disease was at its height motion and sensation were suddenly lost in both legs from the hips down. Medical advice was at once obtained, and various measures were in consequence adopted, without any material benefit. Sea-bathing was then recommended, and this was faithfully persisted in for several months, with the result of restoring sensibility to both limbs, and motion to the muscles of the thighs. Since then strychnia had been administered, both by the stomach and by subcutaneous injections, without the least improvement being effected. Upon examination with the æsthesiometer I found the sensibility of both limbs tolerably good. The mercury of a delicate thermometer, the bulb of which was applied to the thigh, stood at 90°, whilst below the knees the temperature was but 82°. The child was able to flex, extend, rotate, abduct and adduct the thighs, and to flex and extend the legs. There was no power, however, over the feet, and upon careful examination I could not find that a single muscle situated below the knees was capable of contracting from strong induction currents. Both legs were atrophied. They were of the same size, being at the largest part six and a quarter inches in circumference.

"Aside from the paralysis the child appeared to be in good health. Its appetite was good, there was no pain, and it slept well at night.

"I directed that night and morning both legs should be put up to the knees in water of the temperature of 110°, and kept there for twenty minutes; that they should then be well rubbed for half an hour with a coarse towel, and the muscles kneaded for the same period; the child was also to be brought to me three times a week for faradization.

"This treatment was continued for three weeks with but little if any benefit. During this time I had continued to use very strong induction currents for fifteen minutes to each leg three times a week. The machine, which was very powerful, was put in action by a battery consisting of three Smee's cells. The current excited caused the most intense pain, but did not produce the slightest apparent contraction in any muscle. I then determined to make use of the constant current derived from a voltaic pile of one hundred pairs—and consequently possessed of great intensity. The poles were applied first to the tibialis anticus of the right leg. The instant the circuit was made the foot moved up. By continuing the experiment, I found that contractions could be induced in every muscle of both legs. I then had an arrangement constructed for making and breaking the circuit rapidly, and persevered with the treatment daily for a week. During the whole of this period, at every trial contractions were invariably induced in every muscle upon the circuit being made and broken. The warm water frictions and kneading were also continued. I now found that the temperature of the legs below the knees was 86°, and that the circumference was, at the former place of measurement, seven and one-eighth inches. The facts that the toes could now be slightly flexed and extended by voluntary efforts, and that there was some little power over the gastrocnemii muscles, assured me that the cure would ultimately be complete. In this hope I was not disappointed. Amendment continued, and on the 17th of August, when I saw the child for the last time professionally, power over all the muscles of both legs was almost completely restored. Very feeble induction currents now caused contraction. The tibialis anticus was still however, weak; but I have no doubt that by exercise it, as well as all the rest, will become well nourished and strong. At this date the circumference of the legs was eight and a half inches, and the temperature 90°."

This, with the two other cases, presents, Dr. H. remarks, "a fair idea of the action of the continuous galvanic current of great intensity in exciting muscular irritability when it has been apparently altogether lost, so far as other means enable us to determine. After contraction has been well established, and the will begins to assume its power over the affected muscles, I prefer to use the induced or faradaic currents, as being more local in their effects. The continuous current, as I propose to show in a subsequent memoir, does not limit its action to the part through which the galvanism passes, but affects distant regions of the body.

"The voltaic pile of which I make use is one which I devised myself, and which I find to possess great intensity. It is constructed of perforated zinc and copper gauze cut into square pieces soldered together, and the couples separated by pieces of woollen cloth. It is set in action by strong vinegar, a few seconds' contact of the poles (terminated by wet sponges) with the skin will cause vesication. Its use, therefore, requires caution. It cannot be applied to the face, or any part of the head and neck to which the fifth pair of nerves is distributed, without risk of causing great disturbance of vision and perhaps blindness from over-excitation of the retina."

Uterine Tumours.—Dr. SANDS exhibited to the New York Pathological Society (June 14, 1865) a mass of uterine tumours, and gave the history of the case, as follows:—

"It is my painful duty to exhibit to the society a specimen obtained from a woman, whose death was caused by a surgical operation to which she submitted by my advice. She first came under my notice about three months ago, having been sent to me as the supposed subject of ovarian disease, by a medical gentleman in this city, with a view of having an operation performed. The patient was an unmarried woman, forty-five years of age, and of healthy parentage. She belonged to a long-lived family, and having a disease which she supposed would terminate her life in a short time, felt a natural anxiety to be cured, if possible, and to live as long as her ancestors had. I examined this woman with regard to her history, and I found that an abdominal tumour made its first appearance seven years before; the patient was very positive in saying that it first showed itself in the left iliac fossa; that the growth was at first gradual, but that in a year's time it had attained a very considerable size. Just at the time of consulting me her particular grievance was the weight of an umbilical hernia, in the sac of which was accumulated a considerable amount of peritoneal fluid. She represented to me that her health was suffering severely; that life, under the circumstances, had no attractions for her, and that she desired to have an operation performed. An examination of the tumour led me to suspect that it was not of ovarian but of uterine origin, although certain facts in her history and in her physical examination pointed strongly to the existence of ovarian disease. On inquiry I found that menstruation had never been excessive, but that occasionally she had suffered from a suspension of the flow; at no time had there been anything like uterine hemorrhage.

"The enlargement of the abdomen was very great. I did not measure it myself, but the measurement was made by my friend, Dr. Sabine, at the N. Y. Hospital. He found the greatest measurement around the umbilicus to be forty inches. The umbilical opening was circular in shape, two inches in diameter, and there was considerable distension of the sac. In order to prevent the protrusion of this hernia the patient had been obliged to wear a truss, and it was this inconvenience, added to that caused by the tumour, which led her to seek relief from an operation.

"This set of tumours (referring to the specimen) could be partly made out through the abdominal walls, which, by the way, had no very considerable thickness. I could distinguish this swelling, which is a fibrous tumour springing from the fundus of the uterus, immediately below the umbilicus. The uterus itself, which lies beneath, I could not distinguish through the parietes of the abdomen. I was able to feel a swelling of considerable firmness in the left iliac fossa, and a much larger one, in fact the largest of all, existed above and to the right. The tumour allowed an examination through the open umbilicus, and the larger and smaller swellings could be separately distinguished. In regard to fluctuation, I was not certain. It is true that fluctuation existed, but the presence of some dropsical fluid in the abdominal cavity so masked the feeling of deeper fluctuation that, as I said before, I could not be positive about it. I made a vaginal examination, and with great difficulty was able to reach the os; there was no vaginal cervix, for the reason that the uterus had ascended so far from the outlet of the pelvis. The uterus was very decidedly to the left of the median line; I was confirmed in this opinion by the uterine sound, which took a direction upward and to the left. The instrument penetrated to the depth of 3½ inches, and, during an examination which Dr. Krackowizer had the kindness to make afterward, it penetrated about 4 inches. The instrument went up and to the left, and there did not seem to be any considerable thickness between the finger outside and the point of the instrument within the uterus. On endeavouring to move the uterus by rotation of the sound it was found impossible; but on taking the handle of the sound in the left hand, and moving the mass upon the left side with the right hand, a distinct movement was communicated to the handle of the instrument. This made me believe in the existence of a uterine rather than an ovarian tumour. I subjected the woman to several examinations, but was not able to arrive at any more satisfactory conclusion. I was induced to operate partly on account of the woman's urgent request, and partly because I thought it very manifest that her health was suffering from the burden of this swelling and the additional weight of the hernial protrusion, and also because I had made up my mind that uterine tumours could be successfully extirpated. I was led to this conclusion by reading the two cases given by Mr. Clay, of Manchester, and the one by Koeberly, of Strasburg. I omitted to state that there was very decided mobility of the abdominal swelling. The woman went to the hospital and was submitted to a formal consultation; an operation was decided upon, and this I performed on the 12th inst.

"The patient being placed under ether, the operation was commenced by an incision in the median line, about 3½ to 4 inches in extent, below the umbilicus. The abdominal cavity was reached with great facility. I introduced my right hand, and swept it over the left surface of the tumour, and with my left hand felt the right surface of the tumour, and could detect but a single adhesion of about three-quarters of an inch in extent to the greater omentum. I should state that at this time the diagnosis was still uncertain; it was not evident to those who saw the swelling through the incision what was the nature of the tumour. It was considered right to prolong the incision upward. I accordingly enlarged the incision, and thought it necessary to make a very long one, nearly up to the summit of the tumour. That being done, I was able, by placing my hand behind it, to dislodge it from the abdominal cavity, and bring it into view. It then did not appear to be a fibrous tumour, and I was so much in doubt of its character that I tapped it; but no fluid was found. To my great disappointment, on passing down into the pelvic cavity I found that my hand was arrested by large and firm adhesions. My impression was, at this time, that the further prosecution of the operation would be fatal to the patient; yet I readily yielded to the advice of my colleagues to proceed with the extirpation of the tumour, as I had reason to believe, with the other gentlemen present, that if the mass were returned the woman would certainly die, while by the removal of the mass she might have a chance of life. We accordingly commenced the dissection, which was a very difficult operation, as step by step we were met by dangers in the shape of bloodvessels of various sizes, large and small. Towards the last the operation had to be hurried, as the woman showed signs of fainting; and after much trouble, and a great deal of embarrassment, this tumour was finally removed. The mass was removed above the line of implantation of the vagina into the cervix uteri. As soon as this was completed, it became evident that there was very alarming exhausting hemorrhage. The sponges were removed, and pressure made upon the bleeding points, and these points were secured as fast as possible. The main hemorrhage was found to come from a rent in the common iliac vein. The summit of the bladder was unavoidably ruptured; it was, however, closed again by the application of a ligature. The operation consumed about one hour and a half, and, notwithstanding the free use of stimulants, the patient sank and died a few minutes after its completion. Death, in my opinion, was mainly due to hemorrhage, taking place from large bloodvessels in the pelvic cavity, which were unavoidably lacerated during the operation. Regretting, as I do, the unfortunate termination of the case, I am still inclined to regard the disaster as one which might happen in the extirpation of an ovarian as well as a uterine tumour, and can see no reason why, in the absence of deep-seated, extensive adhesions, the removal of the uterus might not be accomplished with a favourable result.

"An examination of the mass removed shows it to consist of the uterus and appendages, the former being the seat of a large number of fibrous tumours, some of which are developed in its walls, the largest, however, forming nearly independent growths, connected with the uterus only by long narrow pedicles. The uterus itself is nodulated externally, but preserves nearly its regular figure; it is greatly hypertrophied, however, measuring nine inches in its longest diameter. The uterine sound can be made to pass over seven inches through a somewhat tortuous canal. The mucous membrane lining the interior is slightly thickened and vascular, but otherwise healthy. The principal outgrowths from the uterus are three in number, one attached to the summit and one to either side of the body of the organ—that upon the right side being the largest. On section these tumours exhibit the usual appearances of the softer variety of fibrous growth, resembling in many places œdematous areolar tissue. The largest tumour—that in the right side—is the seat of several cysts containing serum. The mass, three days after removal, weighed sixteen pounds, but as it diminished considerably in bulk from the loss of fluid during the interval, it is estimated to have exceeded twenty pounds in weight at the time of the operation."—*New York Medical Journal*, December, 1865.

Bifid Uterus and Double Vagina.—The following interesting example of this malformation was communicated to the Boston Society for Medical Improvement (Aug. 28) by Dr. A. B. HOYT, late Surgeon 25th Mass. Vols.:—

The subject of it, aged 57 years, died of a cancerous tumour occupying the left iliac region. She had always been healthy until this disease made its appearance. There had been nothing unusual with regard to menstruation, which ceased at the age of 40. She had given birth to three children; her labours were always severe—the last one unusually so; this occurred twenty years before her death, and was achieved without instruments. The two previous confinements were protracted, but whether there was any abnormal presentation, or if instrumental aid was required, is not known. Her husband, during the patient's life, was ignorant of the fact that any unnatural condition existed. When pregnant, and whilst lactation was going on, menstruation was always suspended.

At the autopsy, the malformation was revealed for the first time, though there were some reasons for thinking that its existence had been known to the patient herself.

On examining the organ, it was found that there were two vaginæ, about equal in size, the left one perhaps a little the largest, and similar as to walls, rugæ, &c. They extended from just within the vulva to the uterus, and were separated by an interval filled with compact cellular tissue. Close to the uterus the vaginæ communicated with each other through an opening of about one-fourth of an inch in diameter. From each vagina a probe passed into a separate uterine cavity. The os uteri in each vagina was small and imperfectly developed, as also was its orifice. The organ, as thus composed. was hardly larger than the normal uterus, but about one and a half inches from the os, it bifurcated into two symmetrical cornua, as large round as the forefinger, and about one and a half inches long; these terminated in the Fallopian tubes, which, with the ovaries and broad ligament, were natural. There was but one ovary to each cornu. The cornua were covered with peritoneum, except where the two layers of the broad ligament separated. and it also covered what might be called the fundus of the compound portion of the uterus. There was nothing to indicate that one side of the uterus had been impregnated and not the other, unless it was the greater capacity of the left vagina.—*Boston Med. and Surg. Journal*, October 26, 1865.

UNIVERSITY OF PENNSYLVANIA.

AUXILIARY FACULTY OF MEDICINE.

The First Course of Lectures in this Department, recently established by the Board of Trustees, will commence on Monday, April 2, 1866, and continue until the last of June, as follows:—

Zoology and Comparative Anatomy,	Prof. Harrison Allen, M. D.
Botany,	" Horatio C. Wood, Jr., M. D.
Geology and Mineralogy,	" F. V. Hayden, M. D.
Hygiene,	" Henry Hartshorne, M D.
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HARVARD UNIVERSITY.

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Clinical, Medical and Surgical Instruction will be given at the Massachusetts General Hospital, adjoining the College, at the City Hospital, and at the Boston Dispensary.

Recitations from approved text-books will be held daily during the session at the College, upon all branches necessary to a medical education. Occasional lectures are also given, and demonstrations, illustrated by the Museums of the College.

During the Summer Session, instruction is given by lectures at Cambridge, on Botany, by Prof Gray; on Comparative Anatomy, by Prof. Wyman; on Zoology, by Prof. Agassiz; on Acoustics and Optics, by Prof. Lovering. To these lectures, students of the Summer Session will be admitted without extra charge.

Fees for the Summer Term (which must be paid in advance), $100, without extra charge for Matriculation, Hospital, Library or Dissections; for six months, $100; for three months, $50.

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Tickets to the Session must be procured before students will be admitted to the Course.

GEORGE C. SHATTUCK, Dean of the Faculty,
No. 2 Staniford Street, Boston.

Circulars can be obtained gratis, upon application to David Clapp & Son, Medical and Surgical Journal Office, over 334 Washington Street, Boston. Jan. 1st, 1866.

[Jan. and April.]

UNIVERSITY OF MARYLAND.

The Fifty-Eighth Session of the School of Medicine, in the University of Maryland, will commence on Monday, the 16th of October, 1865, and will end on the 1st of March, 1866.

FACULTY OF PHYSIC.

Nathan R. Smith, M. D., Professor of Surgery.
Wm. E. A. Aikin, M. D., LL.D., Professor of Chemistry and Pharmacy.
G. W. Miltenberger, M. D., Professor of Obstetrics and the Diseases of Women and Children.
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Samuel C. Chew, M. D., Professor of Materia Medica and Therapeutics.
James H. Butler, M. D., Demonstrator of Anatomy.

The fees for the full course are $90.00. For Matriculation $5.00. For Practical Anatomy $10.00.

The Baltimore Infirmary is a large hospital attached to the College. The Infirmary is an admirable school for clinical instruction, which is open every day throughout the year to the students, where they may witness surgical operations, observe practice, and attend clinical lectures by the various professors at all seasons, without any additional charge. There is always a staff of graduates resident in the Infirmary, besides a limited number of students who are admitted as Clinical Assistants.

Anatomical material is abundant for the study of practical anatomy.

Circulars containing fuller information may be obtained by application to any member of the Faculty.

GEORGE W. MILTENBERGER, M. D., *Dean.*

Baltimore, Aug. 10, 1865.

LONG ISLAND COLLEGE HOSPITAL, BROOKLYN, N. Y.

The Session for 1866 will commence March 1, and end in July.

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Fees for a full Course	$100
The Matriculation Fee	5
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The Hospital Tickets are gratuitous.

Letters addressed to any member of the Council or Faculty will receive attention.

THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES

FOR APRIL 1866.

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TO READERS AND CORRESPONDENTS.

All articles intended for the *Original Departments* of this Journal must be communicated to it for *publication exclusively*.

Contributors who design to favour us with original articles for the next No. should forward them before the 1st of May.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are required. When desired, a *limited* number of extra copies *of papers* will be furnished, if the request for them be made at the time the communications are sent. The extensive circulation of this journal renders extra copies comparatively of little value to authors.

Want of space has compelled us to postpone the insertion of several Bibliographical Notices prepared for this number until our next, among others one of Circular No. 6, from Surgeon-General's Office.

Communications are on hand from Drs. Salisbury, Prince, Walter, Fox, Mead, Lyle, Haughton, Kempf, Wetherbee, Nixon, Hildreth, and Freeman.

The following works have been received:—

Medico-Chirurgical Transactions. Published by the Royal Medical and Chirurgical Society of London. Volume the 48th. London: Longmans, Green, & Co., 1865. (From the Society.)

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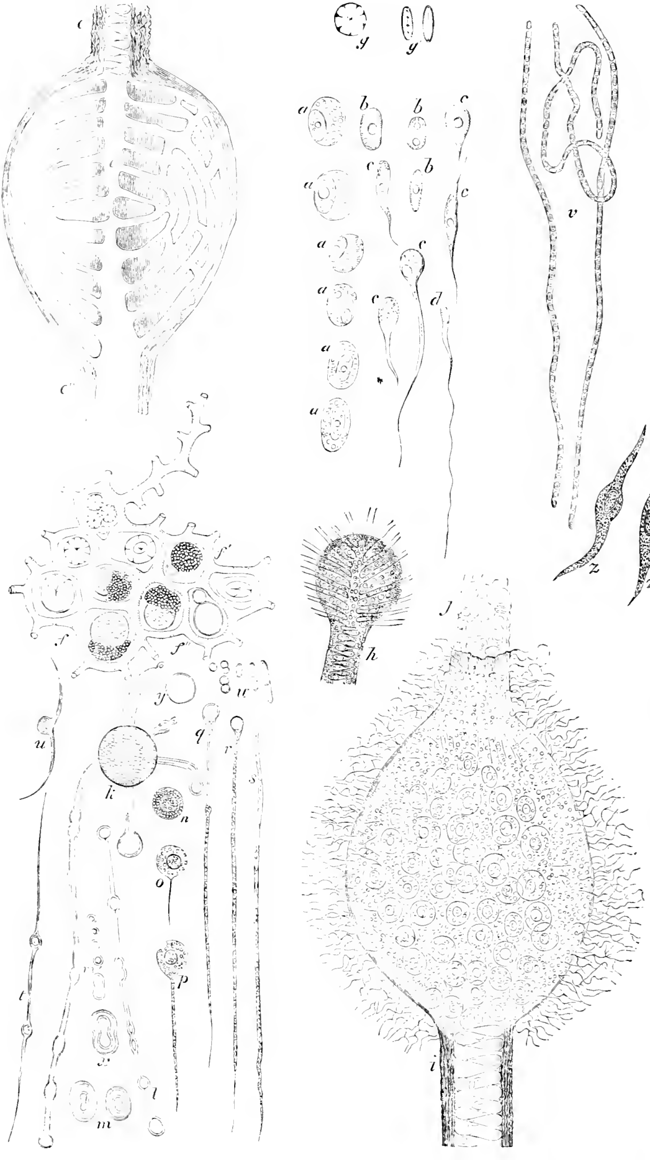
PLATE I.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THE

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FOR APRIL 1866.

ART. I.—*Microscopic Researches, relating to the Histology and Minute Anatomy of the Spleen and Lacteal and Lymphatic Glands; showing their Ultimate Structure and their Organic Elements, and their Highly Interesting and Important Functions: with some Remarks on the Cause of the Ropiness of Mucus, and the tendency of all Healthy and many Diseased Cells to be Metamorphosed into filaments.* By J. H. SALISBURY, M. D., Prof. of Histology, Physiology, and Pathology in Charity Hospital Medical College. (With a plate.)

Previous Knowledge of the Spleen.—Although much has been said from time to time by both ancient and modern writers, concerning the minute structure, organic elements, and functions of the spleen, yet really little has been positively determined relating to the important parts of either. No organ in the human body has excited—in all ages of medical science—more interest, and none have yielded to the inquirer less satisfactory results. It is an extremely difficult organ to investigate, from the fact of its exceeding vascularity, and the great amount of cell, filamentous and liquid products which are constantly being organized, and undergoing in it the processes of morphological transformation and assimilation. It is supplied abundantly with blood by branches of the cœliac axis. Its veins converge, coalesce, and empty their contents into the great portal system which conducts the blood products of the spleen into the liver. The spleen is enveloped in a strong close fibrous membrane of considerable vascularity and elasticity, and intimately adherent externally to the peritoneum, and internally to its parenchyma. This fibrous investment at the hilus of the organ is reflected upon its vessels in all their ramifications, forming an elastic areolar framework which binds together the loose portions of the organ.

From the investing sheaths of the vessels, as well as from the fibrous investment, numerous small fibrous trabeculæ or bands are given off in all directions; these uniting constitute the areolar framework of the organ. This areolar framework is made up of white and yellow elastic fibrous tissue, the latter considerably predominating. What is called the pulp of the spleen occupies the interspaces of the areolar framework.

Its parenchyma consists of a sort of corpus cavernosum, the trabeculæ of which, fibrous in nature, are continuous by their extremities with the fibrous sheaths of the vessels and inner surface of the proper coat of the organ, and in the interspaces is a soft material very closely resembling blood clot, known as the pulp of the spleen. One important fact was early noticed, that the efferent bloodvessels were much larger than the afferent. Another interesting observation was made by Dr. Dobson,[1] that the size of the spleen increased from the third hour after feeding up to the fifth, after which it gradually decreased to its normal quiescent size, which it retained till the next feeding.

Malpighi discovered, in what has been called the "splenic pulp" of the spleen, numerous whitish globular bodies, which have been termed the Malpighian bodies in honour of their discoverer. These were noticed to be attached to the side or at the point of bifurcation of some small artery. They are described as consisting of a closed sac or capsule, containing in its interior a viscid semi-solid mass of cells, cell nuclei, and homogeneous substance. Each Malpighian body has been observed by Kölliker, Burk, Huxley, and others to be penetrated by capillaries, and to be covered on its exterior by a fine capillary network. Leydig regards them as analogous to lymphatic glands, and considers them as really minute lymphatic glands in the spleen.

A very interesting fact with regard to this gland is that it has been entirely removed from dogs, cats, and other animals without its loss producings serious permanent injury. The most constant and permanent effect of its removal is an unusual increase in the appetite; the animals devouring ravenously, and in unusual quantity, any kind of food offered, even that which they would not touch in their normal state.

The food had been noticed to digest well and the animals to increase in weight, the hair becoming unusually sleek and glossy. Another symptom which generally follows the removal of the spleen is an unnatural ferocity of disposition.

From these facts it has been inferred that the spleen is not a single organ, but is associated with other (lymphatic) glands, which may to a greater or less extent perform its functions after its removal. This is believed to be rendered probable from the fact that after the removal of the spleen, the lymphatic glands of the neighbourhood invariably become very much enlarged and clustered together, so as nearly to equal the original spleen in volume.

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[1] Gray on the Structure and Use of the Spleen. London, 1854. p. 40.

Otto Funke, Professor of Physiology at Freiburg, conveys the idea, in his *Atlas of Physiological Chemistry,* that in the splenic pulp, in large cells, the formation of red globules seems to take place by endogenous vegetation.

Kölliker asserts, on the contrary, that these cells are at first nothing more than aggregations of red globules around which a membrane has formed, thus constituting a cell of which these old blood globules become the nuclei, and that they are about to undergo still farther metamorphosis in a retrograde direction. Otto Funke holds that the spleen forms blood disks, while Kölliker, on the contrary, asserts that it destroys them.

C. Morel, Professor at Strasburg, in his recent work on Histology, says the splenic pulp, the substance of which is traversed by the finest vessels and the most delicate trabeculæ, includes elements of different kinds. Its principal bulk consists of cells similar to those of the Malpighian corpuscles, débris of red blood corpuscles, blood pigment, and large cells with many nuclei, $\frac{1}{80}$ of a line in diameter, make up the remainder. He further says, it is a matter of extreme difficulty to determine the relations which exist between the splenic pulp and the larger veins of the organ. Is the pulp entirely outside of the vessels as asserted by some authorities, or are the spaces in which it is contained simply dilatations of the veins, and if this be true, does it form a part of the general circulation? The researches which seem to us most conclusive tend rather to establish the entire independence of the cavities which contain the splenic pulp, yet the fact is not to be accepted as demonstrated. Gray has written at length upon the spleen, and has in his work on this subject many observations that have an interesting and important bearing upon the true structure and functions of this organ, yet without really comprehending its important office, or being aware of the existence of really the most interesting parts of its structure.

Kölliker, in his *Microscopic Anatomy*, pp. 559–60, comes to the conclusion that the spleen appears to be an organ which develops blood corpuscles, and aids perhaps in forming bile. He is also led to believe that the formation of blood corpuscles in the spleen is an abnormal process, as they are not found in the bloodvessels, but in *aneurismatic spurias.*

He further is led to adopt the view that blood disks are disintegrated in the spleen.

Remak thinks that no cells are found in the spleen which contain blood disks, and no blood corpuscles are destroyed in the gland.

Virchow is satisfied of the existence in the spleen of cells containing blood disks. He believes, however, that the blood disks pass from without into existing cells.

Leydig describes a vascular network which penetrates the interior of the Malpighian bodies, and regards these corpuscles as minute lymphatic glands in the spleen.

The foregoing is a brief statement of all, we believe, that is at present positively known and published concerning the minute structure and functions of this interesting organ. I have presented it without any remarks of my own, or any statement connected with the results of my own investigations. From it will be seen the really imperfect and uncertain character of our knowledge of the spleen. From this imperfect knowledge of the organ, it has been inferred :—

1. That the spleen is a glandular organ analogous to other glands of the body that have no excretory ducts, and that it should be classed with the blood glands.

2. That it is the function of the spleen to modify the constitution of the blood, but what this modification is has not yet been determined.[1]

This, without further knowledge of a positive character, conveys but little information which is really useful, as a diagnostic aid in pathological conditions, and throws but small light upon the histology and functions of that organ. Taken, however, with the following investigations connected with its newly-discovered elements and functions, they become highly interesting and valuable.

Investigations to determine the Weight of the Spleen as compared with that of the Body.—1. A robust, healthy female, aged 36, and weighing 135 lbs., who died a few days after the accident of burns on the back and side caused by her clothing taking fire :—

Weight of spleen, which was healthy	2,400 grains
Weight of kidneys	4,890 "

2. In a man, aged about 40, in perfect health and in good condition, shot dead in a recruiting office at Cleveland, Ohio, December 31, 1864, we have the following results :—

Weight of body	160 lbs.
Weight of liver	3 lbs. 2℥ 5ʒ
Weight of kidneys	10℥ 155 grs.
Weight of spleen	5℥ 25 "

3. Dog, male, was shot while in good condition :—

Weight of body	42 lbs.
Weight of spleen	1,920 grs.
Weight of liver	14,400 "
Weight of kidneys	2,880 "
Weight of testicles	472 "

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[1] Brig.-Gen. Hammond, former Surg.-Gen. U. S. A., informs me since this paper was written, that he has an extended series of investigations connected with the spleen in the human subject, and in a great variety of animals, in which much that is new concerning this interesting gland is developed. Not having had the opportunity of seeing his interesting paper and extended illustrations, I regret that I am unable here to refer to the new developments he has made connected with the structure, histology, and functions of this interesting and important organ.

4. Large gray rat, male, good condition :—

Weight of body	15,360	grains
Weight of spleen	120	“
Weight of kidneys	40	“

5. Raccoon (*Procyon lator*), male; killed in January; good condition :—

Weight of body	9½	lbs.
Weight of spleen	297	grains

6. Young game cock, nine months old :—

Weight of body	30,720	grains
Weight of spleen	34.16	“
Weight of kidneys	40.39	“

7. Four game chickens, three months old :—

Weight of the four bodies	46,080	grains
Weight of the four spleens	44	“
Weight of the four livers	1,224	“

8. Snapping turtle (*Chilonuria serpentaria*) :—

Weight of body	32,640	grains
Weight of spleen	88	“

From the foregoing results the weight of the spleen, as compared with that of the body, is as the following numbers :—

Human (female)	1 to 432
Human (male)	1 to 506.72
Dog	1 to 161
Gray rat	1 to 128
Raccoon	1 to 145.6
Young cock	1 to 899
Young game chicken	1 to 1,049
Snapping turtle	1 to 371

Weight of the liver as compared with that of the body :—

Human (male)	1 to 50.57
Dog	1 to 22.4
Four chickens	1 to 37

Weight of the kidneys as compared with that of the body :—

Human (female)	1 to 212
Human (male)	1 to 248
Dog	1 to 112
Rat	1 to 384
Cock	1 to 758½

In proportion to the weight of the body, the spleen is larger in mammals than in birds, reptiles, and fishes.

In mammals the spleen is placed close to the left end of the stomach. In birds, reptiles, and fishes, the spleen is not only smaller, but firmer and more rounded, and is usually in them further removed from the stomach, and placed in the midst of the mesentery, where it appears to perform, to a considerable extent, in addition to its office in mammals, the functions of a lacteal system.[1]

In such animals the spleen is filled with Malpighian bodies which are plainly visible; while in most mammals, and especially in all such as are well supplied with mesenteric glands, the Malpighian bodies are seldom met with, especially in mature animals, or in the human subject; and when they are found, they are extremely faint in outline. This renders the views of Leydig highly probable that they are really lymphatic glands in the spleen, or, what appears to be more probable, bodies which take the place of the mesenteric or lacteal glands of mammals.

Occasionally an instance is met with in the human subject where the spleen is said to have been found rich in Malpighian bodies; this, however, must be quite unusual, as in all my examinations I never have met with an instance of this kind. It would be interesting in such cases to determine whether the mesenteric glands are not wanting, or abnormal, and to obtain as accurate histories as possible of the digestive peculiarities of the individuals during their healthy existence.

In the human subject, in old age, the spleen not only decreases in weight, but decreases considerably in proportion to the entire body, being as 1 to 700, usually.

In intermittent fever it becomes generally more or less enlarged. In some cases it attains the enormous weight of 18 to 20 lbs.

Structure of Spleen.—The spleen is made up of the following anatomical elements:—

1st. A fibrous tissue forming externally its investing envelope, adherent externally to the peritoneum, and internally to its parenchyma. At the hilus of the organ, it is reflected upon its vessels, and, accompanying them into its interior, forms a sort of capsule of Glisson. This fibrous envelope and capsule sends off bands and bundles of fibres to all parts of the organ, interlacing and uniting with each other and with the arterial trunks, forming numerous trabeculæ and a complete fibrous framework of considerable elasticity, which binds all parts of the spleen securely together.

2d. An artery which divides and subdivides, distributing its numerous large and thick-walled branches to all parts of the organ, and which are securely held in position by fibrous bands and bundles, which inosculate with those of the external arterial walls.

3d. A vein of unusual size formed by branches converging from all parts of the organ, and which forms an important branch of the portal vein.

4th. An extended plexus of thin-walled capillaries which connect the arterial and venous extremities, and which often, by their divergence and convergence, form ovoid masses or bodies which connect one arterial extremity with the beginning of a venous branch.

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[1] In birds, reptiles, and fishes, there appears to be but little appearance of a lacteal system, like that of mammals. The mesenteric glands are almost totally wanting.

5th. *Tubular glandules*, which are the arterial terminations, and which are lined with peculiar glandular cells that form and set at liberty the transparent thin-walled cells from which are developed cells that subsequently become transformed into fibrin filaments. These *tubular glandules* are numerous, and have very thick, strong, and highly elastic walls.

6th. *Oval splenic bodies (so-called splenic cells).*

7th. Malpighian bodies, which are connected with the sides, bifurcation of, and extremities of arteries. They are more or less globular in form, and are made up of an external fibrous envelope formed by the expanded external arterial wall, forming a sac, in which are parent glandular cells that organize cells like those developed by the tubular glandules. In addition to this they develop in the human subject, in most other mammals, and in birds, yellow pigment, with rather a reddish tint; and in the reptiliæ and many fishes, a dark-coloured pigment, like that which is seen in the human spleen in the disease known as melanosis. These bodies are connected with the arteries also by capillary vessels, which pass around and abundantly through them.

In a few instances in birds, I have found these bodies terminating a minute arterial extremity, in which case they form a fibrous ovoid head; and are usually smaller than those attached to the sides and bifurcations of arteries. The internal arterial wall subdivides within into numerous radiating capillaries, which pass out of the body in every direction, like the radiating branches of a tree. The Malpighian bodies appear to perform the functions of mesenteric or lacteal glands, and, in addition, organize pigment cells which are usually in mammals of a yellowish or orange colour.

8th. *Amyloid glandules.* These are made up of a meshwork of highly refractive, pearly, capillary vessels, which communicate with the blood stream.

9th. *Nerves and lymphatics.* The lymphatics take their rise from the whole surface of the spleen, and communicate with the thoracic duct. The nerves are derived from the right and left semilunar ganglia and right pneumogastric nerve, and are small and form a slender splenic plexus surrounding the artery and entering the spleen with its branches.

The spleen is remarkable for the size of its artery, which is larger in proportion to the organ than in any other instance. The hepatic artery is rather larger than the splenic in young subjects; but in adults smaller; yet the liver in the latter is from five to seven times the size of the spleen. The splenic arterial branches are also remarkably and universally large, elastic, and thick-walled, when compared with the main trunk, indicating that they are designed for important functions. The arterial terminations are noticed to be lined with a peculiarly thick glandular epithelium, the outside cell wall of which is more or less doubly fusiform or tapering each way from the centre. In the centre is a large, highly refractive nucleus varying greatly in size and shape, according to the rapidity of the organizing processes going on in the cell. The splenic vein constitutes one of the principal trunks of the portal vein. Although the splenic artery is very large, the splenic vein is still larger. In a child three months old, according to Haller, the artery measured twelve hundredths of an inch, the vein fifteen hundredths.

In a child eighteen months old the numbers were thirteen and nineteen. At three years old, fourteen and twenty-six. According to Sir E. Home, the trunk of the splenic vein compared with that of the artery, when both were filled with wax, is found to be in the proportion of five to one in its size.

Arterial Terminations.—The arterial subdivisions all terminate in one of four ways, viz :—

1. In *tubular glandules* followed by simple capillaries.
2. In tubular glandules followed by the oval splenic bodies (*i*, Pl. I.).
3. In Malpighian bodies (rare) in which the internal coat subdivides into radiating capillaries (*h*, Pl. I.).
4. In capillaries direct without the intervention of tubular glandules.

The most usual termination is in *tubular glandules*, followed by the *oval splenic bodies.* When the arteries terminate in tubular glandules followed by simple capillaries, their walls become very much thickened and highly elastic. This thickening is entirely in the external wall and in the lining epithelium. These terminate suddenly in a blunt oval extremity; while the internal tunic passes on, dividing frequently and forming thin-walled and highly elastic capillaries into which the fibrin cells organized in the tubular glandules pass, and are then partially transformed into filaments before reaching the veins. This is not a common mode of arterial termination. The large nuclei of the parent cells of the epithelial lining of the tubular glandules are exceedingly transparent and highly refractive; so much so, that they are with difficulty traced. These, when carefully examined immediately after death, have either a spherical or oval form, according to the degree of their distension. It is very difficult, however, to trace their true outlines. Their walls are highly elastic. When actively engaged in their functions, they are capable of considerable distension.

The nucleus is usually more plainly visible than the walls of the parent cell. The peculiar function of this epithelium is to organize a large, and at first exceedingly transparent and highly refractive bladder-like cell (*y*, Pl. I.), the envelope of which is so thin, delicate, and pliable, that it has more the appearance of a globule without cell walls than of a cell. It is to all appearance, at first, entirely destitute of any visible contents. Its walls, however, soon become more and more firm, a central nucleus appears which gradually grows more and more evident, and this soon is surrounded by little globules (which are called granules). We now have before us the colourless corpuscle of the blood (*n*, Pl. I.), or really a *fibrin cell*, or a cell that becomes transformed into filamentous products; for as soon as it enters the extended plexus of elastic thin-walled capillaries, it hugs and sticks to the wall of the vessel, creeping along slowly, and as soon as mature sends out a thin hair-like process which continues to elongate as the cell slowly progresses, and finally is transformed, all but the nucleus, into an exceedingly fine and highly transparent and friable fibrin thread. The central nucleus when it escapes is irregular in outline, with its walls more or less flattened and folded. This takes up hematine and a highly plastic fluid; becomes smooth, highly refractive, and distended, and forms the blood disk.

When the arteries terminate in *tubular glandules* followed by the *oval splenic bodies*, the fibrous coat of the *tubular glandules* suddenly expands into an oval head, or large thin-walled oval sac, which is highly elastic (*i*, Pl. I.). The inside layer of the tubular glandule (*i*) as it enters the oval splenic body, sends off on every side diverging branches, like the radiating branches of a tree, of thin-walled elastic capillaries, which again converge in the farther half of the sac, coalesce with the central main vessel, and form as they leave the *oval splenic* body a venal branch of the splenic vein (*j*, Pl. I.). The fibrin cells which are formed in the tubular glandules (see at *i*, Pl. I.) hug the wall of the main vessel, as they enter the oval splenic body, creeping slowly along, and as they come up with the mouths of the radiating capillary branches,[1] they pass into them, while the red globules and serum keep mostly the centre of the central vessel, and pass directly through the oval splenic body into the venal branch.

The fibrin cells, however, clog up and distend the radiating capillaries, so that the oval splenic bodies, during rapid digestion and organization, become distended, causing the bulk of the spleen to increase.

These fibrin cells, during their slow-creeping passage through these thin-walled vessels, are gradually, after becoming fully mature, spun or developed into fibrin filaments[2] of extreme tenuity and transparency, so that by the time they have reached the veins they enter them as fibrin filaments or as cells far advanced in filamentous metamorphosis.[1] They are now in a condition to move more rapidly, yet they still hug the wall of the vein in the outside stream where they rather creep along than flow.

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[1] The figure at *e*, Pl. I., gives an approximate, though not a strictly correct idea, of a section of an *oval splenic body*. The divergence and convergence of the capillaries are here represented, though not accurately, as they really lie much more compact, with less interstitial tissue than would appear from the figure. They are placed farther apart than they really occur, for the purpose of giving a better idea of their arrangement.

e′ represents an arterial extremity or tubular glandule, and *e″* a venal extremity. The capillaries of the *oval splenic body* are made up of the inner layer of fusiform epithelium of the arterial extremity, and connect it with the lining epithelium of a venal branch.

[2] There has been much scientific experiment and speculation regarding the chemical difference between *albumen* and *fibrin*, and attempts have been made by able chemists to trace by slightly changing the formula, the transition of the for-

The capillaries of the oval splenic bodies are so thin and transparent and elastic, and always so filled with cells undergoing metamorphosis, that it is extremely difficult to trace them. When injections are thrown into the spleen the cell products (the so-called splenic pulp) are so adhesive and stick so firmly to the vessels that these thin-walled capillaries are mostly broken down and obliterated.

The fibrin cells, when first set at liberty in the tubular glandules (where they emanate from fusiform epithelial cells possessing the singular property of muscular contractility),[2] are very large, highly transparent (containing no visible contents), readily yielding to pressure, and appear like globules of highly attenuated matter; though they must have thin walls, as it is impossible to make them coalesce or run into each other by pressure. They soon become more and more opaque, a large central nucleus appears in which granules or minute globules soon become evident. This nucleus soon becomes nucleated, the outside cell wall contracts and finally conforms to the large nucleus, at which juncture we have the mature fibrin cell or colourless corpuscle. The cell now takes on a kneading *amœba*-like movement, and finally filamentous development sets in, and the cell is spun into

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mer into the latter, and *vice versa*. The truth appears to be from facts unfolded by these investigations, that there really is no chemical difference. That the sole difference is one of condition merely. That fibrin when reduced to perfect solution is albumen, and possesses no longer the property of forming a fibrinous clot. That when cells are formed from albumen and these are developed into filaments, we have a body which will spontaneously clot, and which is genuine fibrin. That fibrin proper is always in a filamentous condition, and that when it loses this condition, as in the chyme of carnivorous animals that feed largely upon fibrin, it becomes albumen. This will more fully appear further on.

[1] The same or a similar process of fibrin cell spinning is constantly going on in the lacteal and lymphatic glands. Hence the reason why the lacteal fluids clot or coagulate after they have passed through a lacteal gland, which property they did not previously possess. Such cells as escape being developed into filaments in these glands constitute what are called colourless corpuscles of the blood. These exist mostly in the outside stream of the blood, where they move slowly along hugging the wall of the vessel with the fibrin.

[2] These parent epithelial cells appear to be the parent muscular fibre or fibrin cells, and which possess singular independent powers of contractility. The same class of cells are largely developed in all the lacteal and lymphatic glands; in the arterial extremities (tubular glandules) of the kidneys, where cells are rapidly developed, and in the arterial extremities (tubular glandules) of the liver where cells are also rapidly formed. This subject will be more fully treated of in another paper on the Minute Anatomy, Histology, and Functions of the Lacteal and Lymphatic Glands and of the Liver and Kidneys.

a fibrin filament of extreme tenuity, setting at liberty the nucleus, with some of the surrounding minute pearly globules or cells. All of these changes take place mostly in the thin-walled capillaries of the *oval splenic bodies* (*i*, Pl. I.) during the slow passage through them of the fibrin cells and their filaments. These processes will be described more in detail further on. The *oval splenic body* figured at *i*, Pl. I., is from the human spleen soon after death. The large fibrin cells, in an advanced stage of development, are faintly seen in this body.

These are active organs of the spleen, and are the bodies that have been described as "*splenic cells and pulp.*" It is impossible to arrive at their real nature and functions without examining the spleen while the animal is still alive and the spleen engaged in its normal organizing processes; for the reason that the cell products organized in the *tubular glandules* pass so rapidly through their several stages of development and metamorphosis in these bodies, that soon after death the cells in process of formation at death have passed through their several stages of development and metamorphosis and disappeared, while there being no nutrient materials for forming new cells the glandular tubules necessarily become empty or only contain cell products in the last stages of transformation. The oval splenic bodies are numerous in the spleen, and constitute the most usual mode by which the arterial extremities communicate with the veins. These bodies are very soft and fragile, being readily broken down between the slides of the microscope, and in minute dissections: on which account the dissections and microscopic manipulations must necessarily be conducted with great patience and caution. Another difficulty exists in the cell products (rapidly undergoing metamorphosis) which distend these bodies and obscure their structure.

At *z*, Pl. I., is represented an epithelial cell from the parent epithelium lining the tubular glandules. The internal layer of this epithelium, when examined *in sitû*, seems to consist of oval nuclei which are highly refractive, imbedded in a structureless substance—the walls of the parent cells not being distinguishable in consequence of their extreme paleness. By carefully teasing out this membrane or layer by the aid of fine needles under a magnifyer, the cells may be detached when they are recognized as fusiform in shape (*z*, Pl. I.), with a very prominent bulge opposite the situation of their nuclei.

There are two sets of these cells, an internal (*z*) and external (*z′*). The external is generally regarded as purely muscular—known among histologists as non-striated muscle—permanently remaining in an undeveloped condition; while the internal is regarded as epithelium. The internal cells are arranged longitudinally, while the external are arranged transversely. They differ somewhat in appearance, those of the external layer being more finely granular and regularly fusiform. Both possess singular powers of contractility, like that of the muscular fibre. The cells of the external layer can be more plainly traced than those of the internal. Both of these layers develop fibrin cells.[1] Filaments of highly attenuated fibrin can be seen at 1, Pl. I., penetrating the walls of the oval splenic body and the venal branch emanating therefrom. Beyond where the vein wall is ruptured, is exhibited at *j* the coiled and twisted meshwork of fibrin filaments that make up a great portion of the outside blood stream in the veins that emanate from the oval splenic bodies. After the majority of the fibrin cells are developed into fibrin filaments these filaments with the fibrin cells not metamorphosed pass on into the veins, where they form a hollow cylindrical tunic hugging the inside wall of the veins and arteries, while inside of this cylinder flows a more liquid stream of blood disks and serum. The central current is very rapid in its movement, requiring but a few seconds for it to perform its round of circulation; while the surrounding cylindrical tunic stream of fibrin filaments and cells moves very slowly, apparently creeping along, hugging the inner wall of the bloodvessels. We have then in the bloodvessels of all parts of the body *two blood streams*, an outside and a central. The outside stream moves slowly and contains the fibrin filaments and cells and other nutrient products for nourishing the tissues, while the inside stream contains but few fibrin filaments and fibrin cells (colourless corpuscles), and moves with rapidity.

When a part is irritated and becomes inflamed, or when there is any lesion resulting in inflammation, there is a tendency for the outside current or nutrient cylinder of fibrin filaments and cells to become thicker and thicker, in proportion to the height of the inflammation, and the central current to become smaller and smaller till the former fills the entire bloodvessel, and the central current is entirely excluded, when there results a fibrin clot choking up the vessel; which condition is often followed by gangrene and sloughing. The central current appears to be essential to the progress in movement of the outside stream.

Arteries terminate in Malpighian Bodies.—This is, strictly speaking, rather an unusual mode of arterial termination in the spleen. Yet it is sometimes met with, and more frequently in birds than in any other animals I have examined. At *h*, Pl. I., is seen a representation of a sample of this mode of arterial termination. The outside wall of the tubular glandule (arterial extremity) expands, forming a delicate outer coat of connecting tissue for the Malpighian corpuscle, while the inner tunic of the artery as it enters the Malpighian body, continues to send off diverging capillary branches on every side like the radiating branches of a tree, while the main central trunk of the internal tunic passes directly through the centre. The fibrin cells developed in the tubular glandules hugging the wall of the central vessels, pass into the diverging capillaries as they come up with their mouths; while the red globules and serum maintain for the most part the central channel.

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[1] We call the attention of histologists particularly to these layers of fusiform cells lining the tubular glandules. They exist to some extent throughout the arteries, but nowhere assume the development that they do in the arterial extremities of the glands, and especially of the spleen and lacteal and lymphatic glands. They are highly interesting elements in the process of cell organization. The external layer is known as non-striated muscle, permanently remaining in an undeveloped condition. The fibrin cells developed from the fusiform cells in their passage through the spleen, assume during one stage in their filamentous transformation a strong resemblance to their fusiform parent cell.

There appears, however, to be no direct communication between the Malpighian tissue and the bloodvessels, save through the thin capillary walls.

The walls of the capillary vessels appear to be made up entirely of the inside layer of fusiform epithelium lining the arteries. These cells are arranged longitudinally, the same as in the arterial extremities, and each is provided with a nucleus which is plainly visible in the capillary wall. The boundaries of these cells are, however, quite indistinct under the best glasses, so closely are their edges blended and united to each other. By carefully teasing out a capillary vessel with fine needles under a magnifyer, occasionally one of these fusiform cells with its contained nucleus may be separated. The epithelial cells possess the peculiar property of transmitting minute bodies under particular states and circumstances. This power of transmission is much greater than is generally supposed. Filamentous fibrin, and even blood disks and the spores of cryptogams, under the proper conditions, freely pass. In acute catarrh, or when the system is under the influence of large doses of iodide of potassium, blood disks without any hematin pass through the capillary walls in large numbers, and flow from the mucous nasal surfaces in the white clear watery serum. This any one with a fair microscope can test for himself.

The spores of cryptogams are found largely throughout the tissues, often, and in the blood and frequently in great abundance in the urine. These spores and blood disks are much greater in diameter than the highly attenuated and transparent filaments of fibrin in the blood.

Amyloid Glandules.—In the spleen are found minute bodies containing a mesh of highly refractive pearly cylindrical capillaries (*f*, Pl. I.). These capillary vessels are readily broken across, fracturing apparently like glass. They are always distended, highly refractive, and of a beautifully pearly lustre. They resemble a meshwork of fine pearl glass tubules. In these vessels may be noticed minute pearly drops, and on the membrane stretched across the meshes, the same kind of pearly drops aggregate into more or less spherical masses (*f′*), and finally these spherical masses of globules appear to melt down and gradually form one or more large globules (*f″*).

These large globules subsequently take on a cell wall, and we have formed the genuine corpora amylaceæ. The cell walls soon begin to fracture around the edges and in the centre, and allow a peculiar refractive highly plastic fluid to escape. After the contents have escaped the cell cases keep on fracturing and finally entirely break up and disappear. They are found in all stages of disintegration in the blood stream. At *g*, Pl. I., is represented a side view of an emptied so-called amyloid cell, and at *g′* an edge view, showing that they are flattened circular cells. They are often marked by concentric rings.

These cells are not amyloid in their character, as has been supposed. They are the true *myaline* cells, or those cells which contain medullary nerve matter. The contents of these cells, after it has escaped from the cases, become aggregated into large globular masses (*k*, Pl. I.), and from the sides of which are developed beautiful, double-walled, pearly, tubular filaments, precisely like those of nerve tissue. These filaments extend and contract over and over again, double up, become beaded, and finally break up into beautiful globules as seen at *m*, and *m′*, Pl. I., which is in every respect analogous to the medullary nerve matter of the brain and spinal cord.

In health, this amyloid matter forms a thin plastic covering to the blood disk, which becomes its vehicle of transmission, which to a certain extent insulates it, and renders it plastic, pearly, and yielding. The amount of this substance investing the blood disks is in direct proportion to the causes exhausting nerve tissue. Its amount present and attached to or in the blood disks, is readily indicated by their plasticity, the readiness with which they yield to every external force, their tendency to stick together, so that, as they separate, filamentous prolongations are drawn out from each, and their little liability to arrange themselves in piles or to become nummulated, and by their pale red pearly hue. The absence of this medullary matter is indicated by the deep red opaque colour of the disks, their rigid nummulated form, the tendency to arrange themselves in piles and want of pliability and plasticity.

By this means those labouring under exhausting nerve influences, such as excessive mental labour, nervous excitement, or exhausting disease, may be readily distinguished from those strong, robust, merely physical persons who trouble themselves little in a mental way about anything.

This interesting and beautiful application of a truth, affords the medical practitioner a simple and valuable diagnostic aid in disease, and points out to us again where the microscope may be of important service to the physician.

In the spleen are developed so-called corpora amylacea. We can no longer hold to the idea of these bodies being at all allied either to starch or cellulose. They are strictly speaking *myaline cells*, and are filled with medullary nerve matter[1] and contribute to make up what has been denominated globulin of the blood disk.

Virchow discovered that the so-called corpora amylacea (myaline cells), occurred largely in nerve tissue. He found that they existed to the greatest extent and in the greatest numbers in the ependyma of the ventricles and spinal canal, and that they are more abundant the greater the thickness of the ependyma. Whenever from any pathological cause the neuroglia becomes increased, the so-called corpora amylacea (myaline cells) are correspondingly multiplied.

Here we see that Virchow found these bodies intimately connected with nerve tissue.

It is now about thirteen years since Virchow first discovered the peculiar reaction of the corpora amylacea (myaline cells) found in the nervous centres with iodine. These bodies, from this peculiar reaction (iodine striking with these cells a beautiful blue and sometimes a green if albumen is present), have by some been regarded as real starch, and by others analogous to cellulose. Virchow next discovered these cells in a diseased spleen (sagoey spleen) and subsequently they have been found in diseased kidneys and livers, and in diseased tissues.

Virchow regards these amyloid bodies (myaline cells) as more analogous to cellulose than to starch. But from cellulose again they are distinguished by the fact of their becoming coloured blue on the application of a pure solution of *iodine alone.* *Cellulose* behaves precisely like *cholesterine,* which remains colourless when treated with iodine, but on the other hand assumes a blue, or under certain circumstances a red or orange colour upon the addition of iodine and sulphuric acid. Virchow says that amyloid bodies are believed not to occur in the blood. The reverse of this, however, is true. They are very frequently met with in the blood of many persons that I have examined. As they appear in the blood, they are generally emptied of their contents, merely exhibiting thin, flattened, concentric, usually fractured, highly refractive cases.

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[1] The matter in the myaline cell (so-called corpora amylacea) which causes them to assume a *blue colour with iodine,* resides wholly in the cell membrane or case. This peculiar substance has given rise to the general opinion that these bodies are amyloid or starchy in their nature. This body is soluble in ether, and crystallizes from the ethereal solution, in beautiful acicular crystals that arrange themselves in a stellate manner, or radiate from a central point.

It resembles seroline somewhat, only the crystals are not as long and slender. It probably is one of the unsaponifiable fats resembling cholesterin and serolin. It is coloured a beautiful blue (ultramarine) with iodine. On account of the peculiar similarity between this body and starch in its deportment with iodine, and out of deference to the term given to the bodies by Virchow, from which it is obtained, I propose for it the name of *Neuro Amyline.*

It has led histologists and physiologists to adopt very erroneous views regarding the character of the so-called *corpora amylacea,* and shows upon what slight grounds grave errors may be made in histological and physiological inquiries.

These amyloid bodies (myaline cells) are the same as are developed in the spleen. They are the true myaline cells filled with medullary nerve matter. This medullary matter is discharged from the cell cases, which, when they have become emptied of their contents, become fractured in various ways in the centre, and around the edges; and within, appear concentric markings. Their contents is a highly refractive, pearly, viscid matter in the form of globules. Soon after its discharge it begins to change its shape, moving slowly, and finally sends out numerous tubular filaments in various directions, which extend and contract and extend, creeping about in various ways, subsequently breaking up into beautiful globules which appear to be single or double rings (*m*, *x*, and *m′*, Pl. I.). These are taken up by the blood disks which transmit them to their destinations. This matter communicates a high degree of plasticity, and refractive pearly lustre to the disks. This appearance is in direct proportion to the activity of the nervous system. So strongly marked is this, that by simply examining the blood microscopically, it can readily be determined whether a person is actively engaged in mental pursuits, under the influence of nervous exhaustion of any kind, or whether he is purely devoted to physical undertakings, is strong and robust, and is labouring under no influence which is exhausting his nerve tissue.

The contents of these myaline cells perform an important office in communicating plasticity to the walls of the fibrin cells and filaments. Little drops of it are often seen attached to the fibrin filaments after they have become developed from the fibrin cells. These become aggregated and are subsequently developed into filaments, and finally these filaments break up into globules as before described.

The medullary nerve matter, or myaline from the myaline cells, performs the office of surrounding the axis cylinder of the nerves, forming an insulating tunic between it and the nerve sheath, which prevents the nerve force from escaping in its transit save at the terminus. In low typhoid types of disease, this medullary matter is seen in little pearly rings or globules, and in beautiful beaded tubuli often in the blood.

From such experiments as I have made, I am satisfied that cholesterin is found in these cells, and is a constituent of medullary nerve matter. This matter makes up the little pearly globules in mammillated blood disks, or in the blood disks of blood deprived to a greater or less extent of its normal fluid.[1]

Fibrin Cells and Filaments.—In birds, reptiles, and fishes, if the spleen be examined carefully, while the animals are still alive, under a microscope of sufficient power, by one familiar with minute dissections and nice microscopic manipulations, there will be observed plastic, highly transparent cells, which are produced in large numbers in the *tubular glandules*, from the parent fusiform cells of the lining epithelium. These cells at first have no visible contents.[1]

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[1] This condition arises in all states of the system where the fluids of the body are being rapidly appropriated, or carried off, as in nursing females, tobacco chewers, exhausting diarrhœa, in diabetes, in chronic diuresis, and in cases where there is extensive ulceration.

They soon, however, present evidence of having cell walls of considerable firmness, and a large central nucleus becomes faintly visible. Subsequently this nucleus becomes nucleated. The cells gradually become more and more adhesive and plastic, sticking to each other in masses as they enter the diverging capillaries of the oval splenic bodies, clogging them up, so that the cells are retarded in their forward movement.

This clogging up of the vessels causes an expansion of these bodies and a consequent enlargement of the spleen.

At this stage, there is a transparent space between the outside cell wall and that of the nucleated nucleus, which space is free from any perceptible contents. The outside cell wall, which is of extreme tenuity, gradually contracts, so as to soon conform perfectly to the cell wall of the nucleus, thus giving the nucleus a double envelope, and which now becomes the cell, while the former nucleolus becomes the nucleus. At this stage in its development, the cell constitutes what is known as the colourless corpuscle of the blood, but really is a mature *fibrin cell*. Now begins a peculiar filamentous metamorphosis of the *fibrin cell*, by which it is developed into a filament of extreme tenuity and transparency.

As the filaments are developed, the cells slowly progress, and by the time they have reached the venal branches they are either fully developed into filaments or are far advanced in this direction.

Here they meet the central blood current, of blood disks and serum, around which they form, with the undeveloped fibrin cells, a cylindrical tunic, which hugs the walls of the vessels along which they rather creep than flow. During rapid digestion, and immediately following it, the oval splenic bodies become greatly distended with developing cells and the spleen much enlarged. This distension is relieved in about four hours after feeding.

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[1] Cells in their early stage of formation in the spleen take on a kind of independent motion, analogous to that exhibited in low protozoon animal organisms, belonging to the so-called *genus Amœba*. Their movements and changes in form belong to the same set of actions; the changeable mass puts forth one or more finger-like prolongations into which the whole body is carried, causing it to change its place. This is immediately followed by prolongations in other directions which in turn expand and receive the entire organism. By this peculiar kneading motion the organisms progress. From this remarkable similarity it would appear, that perhaps forms of the so-called genus Amœba may represent but early stages in the organizations of certain epithelial cell products of animals of a higher type of organization.

The central nucleus of the *fibrin cell* does not become incorporated with the fibrin filament, but is set at liberty with some of the minute pearly globules surrounding it. Others of the pearly globules, or rather minute cells, pass into the tubular fibrin filament during its process of elongation, where they are arranged in single file along the central cavity, forming that peculiar interrupted central structure of an ultimate muscular filament.

The fibrin cells, during their filamentous development, become coated with plastic matter from the *myaline cells.* After the filaments are fully developed, this matter becomes more or less aggregated in little pearly drops along the threads, subsequently (removed from the body) collect together, and are developed into tubular medullary matter (*k* and *l*, Pl. I.). In the live animal, it is no doubt transmitted to its destination before it undergoes filamentous development, or goes to nourish nerve tissue. The blood disks of birds, reptiles, and fishes are peculiar in having a nucleated nucleus. This nucleated nucleus is really a fibrin cell, being, after its escape, one kind of colourless corpuscle of the blood. These fibrin cells, like the fibrin cells of mammals, undergo a filamentous development. This process is beautifully exhibited in the spleen of the turkey and common fowl. As soon as the central nucleus is expelled, the blood disks appear shrunken. They soon, however, absorb more liquid products and hematin, and become again plump and full.

In mammals the mode of formation is essentially the same, but slightly different in some of its details. On account of mammals being less tenacious of life, the examinations cannot be so successfully conducted on the spleen while its normal functions are in progress, as they can on the spleen of the reptilia. With care, however, the cells can be traced through quite all the stages of their formation and metamorphosis. Here we have briefly stated the simple and highly interesting process by which fibrin cells and filaments are formed from the albuminous matters of the blood.

In studying the embryology and successive transformations of the cells of the spleen, those animals the most tenacious of life furnish the best subjects.

The turtle is a good example. The breast-plate can be removed, the animal secured on its back, the spleen exposed, and microscopic examinations continued for hours on this organ while its normal functions are going on.

The successive changes of the cell products of the spleen are so rapid that, in a very short time after death, all of the earlier cell transformations are passed through with, so that nothing is visible save the latter stages in the process and the resultant cell products. On this account, it is impossible to study the early cell morphological processes in the human spleen. If the spleen, however, is examined very soon after death, all of the later cell changes are exhibited.

Birds, fishes, and reptiles, all furnish good subjects for splenic study, and among mammals, dogs, cats, the raccoon, pig, opossum, ox, horse, and sheep are all good examples.

In several instances, I have been able to trace through all their stages the gradual melting down of connective tissue filaments into a plastic, transparent pabulum, and the subsequent formation from this pabulum of first, minute, highly transparent cells (which probably existed in embryo in the filamentous tube) which soon became granular, and, after several hours, had the appearance of highly transparent pus cells. The whole time required for this process was from twelve to eighteen hours. The changes were all gone through with between the slides under the microscope.

Whether this may represent one mode in which pus cells are formed from connective tissue, I am at this stage of the inquiry unable to say. Still, it is quite probable that it may be, and that it is a mode in which filamentous tissues are disintegrated and carried out of the system. In the pabular state they could readily be eliminated.

At Pl. I., *y*, is seen the early appearance of a *fibrin cell* while it is yet in the tubular glandule. At *n* is represented the mature fibrin cell. At *o* it begins to take on the filamentous development, and has projecting posteriorly a fine hair-like process. At *p* is seen a still later stage, when the filament has become enlarged and elongated, and is now discovered to be tubular. At *g* its tubular appearance is more marked, the minute cell contents of the fibrin cell having quite all passed into the filament. At *r* the nucleus is about being liberated, and the filament nearly perfect in its development. At *s* the filament is seen separated from the nucleus, and is perfectly developed. At *t* and *u* are exhibited other forms of the filamentous development of fibrin cells.

Albumen and Fibrin Cells and Filaments.—The albumen of nutrient materials is converted into fibrin in the spleen and lacteal and lymphatic glands by first being organized into fibrin cells. These cells, after undergoing certain changes in character and appearance, are transformed into filaments of fibrin, as previously described.[1] The cells organized from albuminous materials, and which are known as colourless corpuscles of the blood, are here denominated *fibrin cells,* as this name indicates more precisely their real character.

There have been much scientific experiment and speculation regarding the chemical difference between *albumen and fibrin*, and attempts have been made by able chemists to trace, by slightly changing the formula, the transition of the former into the latter, and *vice versa*. The truth appears to be, from facts unfolded in these investigations, that there really is no chemical difference. That the sole difference is one of condition merely. That *fibrin*, when reduced to perfect *solution*, is *albumen*, and possesses no longer the property of forming a fibrinous clot. That when cells are formed from albumen and these are developed into filaments, we have a body which will spontaneously clot, and which is genuine fibrin. That *fibrin* proper is always either in a cellular or filamentous condition, and that when it loses these states by being dissolved, as in the chyme and chyle of carnivorous animals who feed largely upon fibrin, it becomes albumen.

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[1] Mucous cells also undergo filamentous development, and to the highly transparent and loose structured filaments formed from the mucous cells, is the ropy properties of this substance mainly due.

A too rapid and hasty development of these cells in certain diseased states of the body may result in serious pathological states, as in the exudations in angina maligna, in common diphtheria and in scarlatina. The mucous cells in these diseases become fibrinous.

Blood Disks.—The blood disk is a cell proper, with a cell wall, as is made evident by dissolving its hematin and other contents from it, and from the further fact that the blood disks of birds, reptiles, and fishes have a well-defined nucleolated cell nucleus, which subsequently escapes from the disks.

There is still further evidence that blood disks have a cell wall. If the blood disks of birds, reptiles, and fishes be placed in water, it will be found after a little time that the hematin and other products have been dissolved out, save from the nucleus, and the outside cell wall will be found folded and wrinkled, and the nucleus will appear very plain, while the outside cell wall presents itself as a highly transparent, more or less folded and wrinkled disk of extreme tenuity. Further, if the blood disks of mammals be placed in water, it will be found after a time that the cell products have become all dissolved out, leaving the thin membranous walls folded and twisted in various ways, and many of them so collapsed that they appear as mere short irregular beaded lines. Many of them have the appearance of the wrinkled and folded nuclei of the colourless corpuscles which are found abundantly in the spleen, lacteal and lymphatic glands, and thoracic duct.

These statements are made for the reason that some recent physiologists regard the blood disks as homogeneous throughout, they having no cell wall.

In mammals blood disks are formed from the nuclei of fibrin cells. When the fibrin cells are developed into filaments their nuclei are set at liberty, take up nerve and colouring matters, become highly transparent and homogeneous, assume a flattened shape, and form blood disks. This process can be traced through all its stages in the living spleen.

In birds, fishes, and reptiles one form of the fibrin cell makes up the nucleus of the blood disk from which it escapes and is subsequently developed into a fibrin filament. The spleen, and lacteal and lymphatic glands, are the main organs that organize fibrin cells and blood disks.

Of all these glands the spleen is the most important, and the most largely engaged in this cell forming process.

Bodies Resembling Confervoid Filaments.—At Pl. I., *v*, is represented a peculiar kind of filament which occurs abundantly in the spleen. These filaments possess a slight degree of independent motion, which is oscillatory, or a slow, irregular, intermittent, backward and forward motion of the extremities. They are the mature state of the so-called vibriones (*w*). They occur abundantly in the human spleen and in the spleen of all animals, so that their presence is not abnormal.

Their universal presence is indicative that they perform some important function in the animal organic processes. Similar filaments (apparently different species) occur in all the other glands of the body. The glands seem to be the principal habitat of the mature state of these singular bodies. After the death of the animal they are developed in incalculable numbers during the incipient stage of decomposition, and often in the excretions in low types of disease. Their presence in large numbers is indicative of low states of vitality, where rapid interstitial death and decay are in progress, or of the entire absence of vitality and the inauguration of fermentating and decomposing changes. They appear to act especially as a ferment accelerating fermentation and decay, in both animal and vegetable tissues. They are always present in all animals, and only await either low conditions of vitality or its cessation to multiply in vast numbers. By their presence in animal tissues, they are believed to perform an important function in exciting such interstitial changes in effete particles as to reduce dead and useless matter to those states in which it may be readily eliminated. If this should prove as true as at this stage of the inquiry it appears to be, these interesting little bodies are not without their important use in the animal and vegetable economy. In health they are very much less active than in disease, their movements being scarcely perceptible.

These organisms appear to be confervoid in character and mode of development. There is evidence of their being many distinct species, even in the same animal, as they differ somewhat in appearance in the different glands. Those of the same gland in different individuals appear to be, however, quite similar. In structure and movements they resemble the *Oscillaria*. They excite fermentative changes both in animal and vegetable matters. In their early stages of development they are extremely minute and short. They grow by extending in length, and in their early condition appear more plainly jointed than at more advanced stages. These interesting organisms will be treated of more fully in a paper now ready for the press on Fermentation, Gangrene, Decay, &c.

Cholesterin and Serolin and Neuro-Amyline.—In chemical examinations of the spleen this organ has been found[1] to form largely cholesterin and serolin in its organizing processes. Also a beautiful crystalline matter soluble in ether, and probably another unsaponifiable fat, coloured intensely blue with iodine, is formed in the cell cases of the myaline cells. This body we have given the name of *neuro-myaline* for reasons previously stated, in describing the myaline cells and their contents.

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[1] The paper containing the experiments on this subject is not yet published. These experiments decide the point that cholesterin and serolin are developed

Experiments connected with the lacteal and lymphatic glands prove them also to be other sources of the unsaponifiable fats cholesterin and serolin. A careful examination of the substance of the liver has determined the fact that cholesterin and serolin are not formed in the cells of this organ, but simply secreted by the biliary apparatus (the interlobular cells in their organizing processes) from the portal blood coming from the spleen and lacteal system.

These conclusions are the results of experiments as follows: A portion of the spleen was taken immediately after the death of the animal and treated with ether till no more cholesterin and serolin could be obtained. It was then set aside for twenty-four hours, when on again treating the same portion of the spleen with ether an additional quantity of these bodies was obtained, and this gradual formation of these bodies continued till the transformations in the cell products ceased. The lymphatic and lacteal glands were subjected to similar examinations with similar results. On, however, subjecting the liver to this process a very small quantity of cholesterin and serolin was obtained. On re-treating this same portion of the liver with ether twenty-four, forty-eight, and seventy-two hours after, although cell changes had been going on in the liver as they had under similar circumstances in the spleen and lacteal and lymphatic glands, no trace of these bodies could be separated.

These experiments afford proof that the spleen and lacteal and lymphatic glands are true sources of cholesterin and serolin, while the liver is not; the biliary apparatus of this organ merely secreting these bodies from the portal blood.

Fermentation in the Spleen.—When the spleen of the common fowl is set aside, exposed to conditions which induce decay, in connection with the decay which takes place, alcoholic fermentation sets in, which develops *torula cells and filaments* in considerable quantities, producing in a short time a white mould or dust of cells and filaments over the whole surface.

These torula cells are smaller than those developed in fermenting liver, but of the same general character.

These cells are like those which I have frequently met with in the blood of patients labouring under fevers.

The development of these cells in the decaying spleen is an indication of

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in the spleen during its organic processes. That cholesterin and neuro-amyline are found in the myaline cells so called (corpora amylacea), the former in the cells and the latter in the cell membranes.

the presence of glycogenic matter or sugar in some form, and which is probably generated by it.

Filamentous Fibrin in the Blood.—The presence of filamentous fibrin in the living blood is rendered evident from the fact that these filaments are formed from fibrin cells, by a regular process of filamentous development, which is constantly going on in the spleen and the lacteal and lymphatic glands. It may be detected in the blood, previous to the process of clotting, as follows:—

Receive a drop of blood as it flows upon a warm (100° F.) glass slide, place thin glass over it, and immediately introduce it under the microscope, with the focus previously arranged, so that the eye rests upon it in less than two seconds after it leaves the bloodvessels.

Three sets of cells and blood disks will at once be noticed. One moves freely in any direction with the current. Another set occurs in little masses and lines, and are more or less stationary, turning the freely movable cells out of their course; while the third are twitching and moving or oscillating backward and forward as if tied together by elastic filaments. The apparently stationary masses and lines of cells and disks, and those oscillating or approaching and receding from each other as if connected by elastic threads, will be found on close examination to be controlled in their motions by fine and highly transparent filaments of fibrin, that are precisely like those that are developed from fibrin cells. Another mode for detecting their presence, previous to the process of clotting, is to prepare a weak alkaline solution, make an incision and receive a fresh drop of blood as it flows upon a warm glass slide with a drop of warm alkaline solution, cover with thin glass, and then press upon the thin glass with a clean folded cloth, which presses out from between the slides the movable disks and most of the alkaline solution, which are absorbed by the cloth. Place under the adjusted microscope, where the eye can rest upon it in less than three seconds after it leaves the blood stream. The fine meshwork of fibrin filaments can now be seen and studied nearly as they exist in the living bloodvessels. They will be seen arranged in a web or meshwork, or in small bundles. Along the course of the filaments are attached the minute granules or cells of the fibrin cells (colourless corpuscles), and attached to the filaments will also be found colourless corpuscles, and many partially disintegrated cells and blood disks.[1]

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[1] I am aware that Virchow, and many other investigators of the present day, not having succeeded in tracing satisfactorily the true source of the fibrin of the blood, are leaning towards the opinion that it originates from the fibrinous tissues —is matter in the process of disintegration—is taken up by the lymphatics and transferred to the blood stream, and is to be excreted from the body by the different glands. Bennett, in his work on Clinical Medicine, says: "The effete matters absorbed into the blood circulate with it, and always form an important part of its

This brief statement will be sufficient to guide the inquirer, while he can greatly vary his observations according as his ingenuity may suggest. The more thorough and varied his examinations, the more convincing will be the evidence. The evidence will be made still more satisfactory by carefully tracing the *fibrin cell* from its early stages of development through all its metamorphoses till it finally becomes a filament of fibrin.

The following remarks of Virchow are interesting in this connection:—

> "The fibrils of connective tissue only differ from the fibrin of the blood in not being reticulated, but run a parallel course, whilst in other respects they resemble those of fibrin in a high degree. The intercellular substance of connective tissue presents another point of resemblance with fibrin in the great analogy of its behaviour with reagents. When we expose it to the action of dilute acids, the fibres swell up and disappear before our eyes, so that we are no longer able to say where they are. The mass swells up, every interspace disappears, and it looks as if the whole were composed of a perfectly homogeneous substance. If we slowly wash it, and remove again the acid, a fibrous tissue may—if the action of the acid has not been too violent—once more be obtained; after which the previous condition can be produced afresh and changed again at pleasure. This behaviour has hitherto remained unexplained, and for this very reason Reichert's view—that the substance of connective tissue is really homogeneous, and the fibres are only an artificial product or an optical delusion—has something alluring in it. In fibrin, however, the individual fibres can much more distinctly, than is the case with connective tissue, be so completely isolated, that I cannot help saying that I regard the separation into single fibres as really taking place, and not merely as an artificial one, or as a delusion on the part of the observer."

These remarks and quotations of Virchow are highly interesting in this connection, showing that under the influence of dilute acids the fibrillæ of of the muscular and connective tissues, and of the coagulum of the blood, may be rendered invisible to the eye of the observer, and on carefully removing the acid, the fibrillæ again become visible. Reichert's view of the matter, viz., that these fibrillæ are really an optical delusion, and that the material is really homogeneous, has, as Virchow says, something alluring about it, from the fact that it is wholly imaginary. Fresh blood, or the blood in the vessels of the living body, and immediately after it is drawn, has its fibrin in a similar invisible condition, as are the fibrillæ of blood to which dilute acid has been added. This is a point highly interesting, and one presenting strong evidence in favour of the statements and observations set forth in this paper, viz., that the fibrillæ of the fibrin of the blood are developed from cells, and exist as fibrillæ in the living blood, and that coagulation is merely the contraction and aggregation of those fibrillæ, and the rendering of them visible.

Virchow further says:—

> "But it is very interesting to observe that the fibrillar stage of fibrin is invariably preceded by a homogeneous one, just as connective tissue originally

composition. It was first maintained by Zimmerman that they constitute the *fibrin of the blood*, which instead of being exuded to form the tissues, as has been generally supposed, is excreted from the body by the different glands."

wears the form of a homogeneous intercellular substance (mucus), from which fibres are only by degrees, if I may so express myself, excreted, or, to employ the usual term, differentiated."

Instead of being differentiated from a homogeneous mucous substance, they are developed from cells in the same way that the fibrin of the blood is developed. See (1) Plate I. Virchow says further: "So fibrin too, which is first of all gelatinous, becomes differentiated into a fibrillar mass."

It is singular that at this age after so much has been done in the embryology of animals, and in that of the various organic elements which compose them, that the views with regard to the development of the various fibrillar tissues of the body should be so at variance with those of other organic elements, and with the development of animal organisms. That fibres should spring "full fledged" from the amorphous fluid mass, is an anomaly in organic development.

Finally, the same author draws the following comparison between the formation of these organic elements and crystallization from inorganic solutions, thus: "And indeed in the case of inorganic substances also, we find certain analogous appearances. From deposits of calcareous salts, or silicic acid, which were originally perfectly gelatinous and amorphous, solid granules and crystals are gradually separated."

Here we have by the ablest of histologists a comparison drawn (after being, no doubt, much puzzled at the peculiar apparent mode of development of the fibrillæ of fibrous tissue) between the formation of organic fibrillæ and the development of crystals and granules, in gelatinuous solutions of calcareous and silicic acid salts. No one would be willing, however, to admit that the formation of organic fibrillæ bears any analogy, in fact, to that of inorganic crystallizations.

At Plate I., *a, a, a,* are represented parent connective tissue cells, and at *b, b, c, c, c,* and *d,* same plate, the nuclei of these cells are seen in all stages of filamentous metamorphosis. The connective tissue cell is developed in connective tissue, which is, in one sense, an extravascular tissue like the epithelial. These cells are unlike any other cells in the animal organism. They have very thin, homogeneous walls, and are usually oval, containing one or more plain homogeneous oval nuclei which are the true connective fibre cells, or the cells which are developed into filaments. These nuclei escape from the parent cells, and undergo the filamentous metamorphosis. These homogeneous cells make homogeneous filaments. It is believed at this stage of the inquiry that the parent cells themselves make elastic fibrous tissue, while the nuclei make the non-elastic.

Clotting of Blood.—The clotting of blood, consists in the gradual contraction and aggregation of the fine fibrin filaments existing in the blood. The peculiar backward and forward motion, or the oscillatory movement of the blood disks, between the slides of the microscope, are produced by this clotting process.

Tendency of the Blood to Coagulate in the Vessels of the Living Body in Disease, and Means of controlling such Tendency.—In many pathological conditions of the system there is a strong tendency in the fibrinous filaments of the blood to contract, aggregate and form in the vessels what we usually call clot. From the simple process before described this tendency of the blood to coagulate in the living system can quite readily be determined, and, after careful practice by the physician, may be used by him as a valuable diagnostic aid. The condition of the blood will indicate, to some extent, the therapeutical management of the case. There appears to be a coagulating tendency of the blood in all inflammatory types of disease, and also in many low typhoid conditions of the system. Wherever this tendency exists, there is a *lax condition* of the muscular fibres, especially those of organic life. This disposition of the fibrin to coagulate, and the lax condition of the muscular fibres, constitute often grave parts of disease, and should be combated with such appropriate remedies as will operate against and counteract these tendencies, or gangrene may result. The alkalies and their vegetable acid salts are known to retard the coagulation of the blood and to thin it by increasing cell elimination. Veratria has a remarkable influence in preserving the arterial condition, and in preventing the coagulation of the blood. (See paper on poisoning with the vegetable alkaloids, published in the Oct. No. of the *American Journal of the Medical Sciences*, 1862.) My experience with this body, however, extends only to its effects in poisonous doses, and to its influence upon blood out of the body. Its effects are, however, so marked that I feel an interest in calling attention to its trial in smaller and more diluted doses than is usually given for combating tendencies to the coagulation of the blood in disease.

I know of no body, in the whole range of our materia medica, so admirably adapted for restoring the normal tonic tone of the muscular fibres, as aconite. It acts speedily and effectually, in giving a strong tonic contractile power to all the muscular fibres of the animal body, and especially to those of organic life. The tonic condition produced by this body is persistent and continuous. It is not intermittent like that of strychnia, picrotoxin, veratria, &c.

Homœopathists use this body in all inflammatory diseases, but without understanding that its beneficial influence in these abnormal conditions arises from its action upon the muscular fibres. The tincture prepared according to the U. S. Dispensary, is a convenient form in which to administer this body. No tincture should be used, unless when on applying a drop to the tongue, it produces a numb, tonic, astringent sensation, in from three to eight minutes after being applied. This sensation should last from two to six hours.

For an adult, about five to six drops of such tincture should be placed in a tumbler of pure water, well stirred, and a tablespoonful given every twenty minutes, till eight to twelve drops are given. This will be about as much as should be administered in twenty-four hours to a grown person of ordinary strength.

This treatment should not interfere with that ordinarily followed. It is resorted to as an aid, merely, in restoring the muscular fibres to their normal tonic tone, and in preserving the fluidity of the blood, till other appropriate therapeutical means may produce that alterative action required to restore the system to its normal condition.

Iron and quinia are two of our most valuable remedies, in checking the too rapid development of fibrin cells, and their too rapid metamorphosis into filaments. These bodies should be given in liberal doses, often repeated and continued till the blood presents under the microscope a healthy appearance.

Spleen Small in Fœtus and tends to Decrease in Size in Old Age.—It has been observed that the spleen is particularly small in the fœtus, till near the time of pregnancy, when it increases rapidly in size. The functions of this organ, as previously described, explains the reason. The fœtus derives its nourishment from the products organized by the mother, and hence requires of itself no organs for this purpose, till it becomes an independent being. As the period of fœtal maturity approaches, the spleen becomes rapidly enlarged, in order to be fitted as soon as the fœtus is discharged, to organize products for its tissues. In old age, the spleen has been noticed to diminish in size.

This is what we might expect from the fact that the powers of life become feeble in advanced years, and the system requires much less of organized products to sustain it. The spleen hence, having less to do, gradually diminishes in size.

From the Third to the Fifth Hour after Feeding, the Spleen is Increased in Size.—Soon after feeding, and during and following active digestion, cells are organized in the spleen rapidly. During the development and transformation of these cells into filaments, in the tubular glandules, and oval splenic bodies, they distend the vessels of the latter, on which account the spleen is augmented in bulk. As soon as, or soon after rapid digestion is over, cells are organized less rapidly, and the oval splenic bodies are relieved in a measure, in consequence of which the whole organ contracts to its normal bulk. This explains the interesting fact noticed by Sir E. Home, that soon after a meal the spleen becomes enlarged, in which condition it remains for a short time, and then returns again to its normal size.

Large Size of the Bloodvessels of the Spleen.—The important functions of the spleen are explanatory of the very large size of the bloodvessels of this organ. They explain still further why it is, that it is necessary for the splenic vein to be so much larger than the splenic artery. The spleen is essentially an organ engaged in organizing blood products for replenishing the constant waste in the blood stream, in consequence of which it requires blood not only for its own nourishment, but also nutrient products, from which it may assimilate and organize products for the replenishing of the blood and the support of the fibrinous tissues.

This extra demand requires enlarged means to conduct the desired materials. Much of the blood which enters the splenic artery is in a liquid form ; much of the fluid albumen in this liquid becomes organized into fibrin cells in the tubular glandules. These cells are developed into filaments, and these, with the cell products undeveloped, are less readily transmitted through the veins than the liquid products through the arteries. On this account the splenic vein is increased in size above that of the splenic artery, so that these bulky products may be without difficulty transmitted.

Animals deprived of the Spleen have a Ravenous Appetite, and tend to fatten.—The interesting fact has for some time been known that when animals are deprived of the spleen their appetite becomes peculiarly ravenous, they eating much more abundantly than before they were deprived of this organ, and are not as particular about what they eat. The functions of the spleen explain why this is so. The animals being deprived of one of the great and important organs which organize fibrinous materials and blood disks, the other organs (lacteal and lymphatic glands) which perform similar offices, are unable to supply the system with enough fibrinous materials from the same amount of food, as this food is digested in the same time without a spleen as it is with one. To keep up the supply of fibrinous products, it becomes necessary for the lacteal and lymphatic glands to work more of the time. That beautiful sympathy of action which exists between the wants of the tissues and the organs which supply them with organized nourishment, produces an increased appetite, resulting in more often and thoroughly filling the stomach, so that digestion may continue a greater proportion of the time than is ordinarily required. This enables the lacteal and lymphatic glands, by somewhat overtaxed efforts, to keep up the supply of organized products. The lymphatics become so stimulated to extra exertions that they are gradually increased in size, so as the better to enable them to perform their own normal functions together with those of an absent spleen.

It has also been noticed that animals fatten more rapidly and readily after the removal of the spleen than before. The reason of this is obvious. The organs that produce the majority of the fatty products for the system are not removed, they still being engaged in their normal functions. More nutrient products passing through them than under normal conditions, and these passing more continuously, enable the fat forming glands to organize more fat than usual, to be appropriated. The result is an increased disposition to the formation and deposition of adipose.

Concluding Remarks.—In conclusion, we wish to present some physiological and pathological phenomena, noticed by others, relating to this organ and its diseases, and which are important and interesting in this connection, in the way of corroborating the results which we have arrived at in the study of this gland. On the contrary, our labours will be seen to explain and render clear the observations of others. This remarkable coincidence of reciprocal conformation is confirmatory of accuracy in results ; especially is this so since our investigations were completed and the paper nearly written before having noticed the following observations of others :—

Andral, in speaking of the diseases of the spleen, says that "the *splenic cells* are filled with *coagulated fibrin*, which, although it does not possess any distinct organization, yet enjoys perhaps a greater sum of vitality than the fibrous tissue which contains it, and consequently is more prone to become irritated and altered in its nutrition."

The *splenic cells* of Andral are what we have denominated the oval *splenic bodies*, which terminate the *tubular glandules*. The *coagulated fibrin*, he speaks of in the *splenic cells* (oval splenic bodies), is made up of *fibrin cells* (organized by the tubular glandules) undergoing, in the oval splenic bodies, filamentous metamorphosis, or being developed into *fibrin filaments*. These fibrin cells are retained in the diverging capillaries of the oval splenic bodies, mostly until they are transformed into almost inconceivably fine fibrin filaments, when they pass on through the thin-walled capillaries of these bodies, and enter the venal extremities and form the cylindrical tunic which constitutes the outside blood stream.

Andral further states that "a very frequent cause of induration of the spleen appears to be protracted mechanical congestion, as that from disease of the liver, obstructing the circulation through the vena portæ, from disease of the heart, from ague, &c. In induration of the spleen, the concrete blood in the cells is usually dense, so that the viscus cuts and appears like liver.

"Induration is sometimes attended with a deficiency of colouring matter in the concrete blood of the cells. This deficiency may exist, 1st, in detached points, and the organ then presents a beautiful mottled appearance ; and, 2d, the discoloration may form masses variable in size, of a reddish-yellow colour, finally becoming pale *like fibrin*, with a structure obscurely granular, occasioned by the moulds of splenic cells. These tumours appear to be nothing more than the fibrin of the blood undergoing changes similar to what we see in the veins."

We can readily see how it is that the fibrin filament, developing from the fibrin cells in the oval splenic bodies, may become interwoven and solidified by any cause, such as congestion from hepatic obstructions, which prevents the free passage of the blood and rapidly-forming blood products through the spleen. We can readily understand how it is that, under such circumstances, the cut surface of the spleen should assume a mottled appearance at death and for a reasonable time thereafter.[1]

In the oval splenic bodies, where the constantly entering and developing fibrin cells are being transformed into fibrin filaments, we would have a light-coloured mass of almost pure partially organized fibrin and fibrin cells; while in places made up of congested capillaries filled with blood, we would have a red patch of a softer consistence. The obscurely granular appearance arises from the minute cells and globules from the interior of the fibrin cells: a portion of which are set at liberty, and adhere to the filaments of fibrin when these fibrin cells have undergone the filamentous metamorphoses. Enlargement, according to Andral, "depends either on the blood deposited by the arteries not being removed in sufficient quantity by the veins, whence there is enlargement by mere congestion, or the blood being once deposited, and having become endowed with life, acquires the faculty of nourishing itself by intussusception, whence there is enlargement by hypertrophy. Diminution of the spleen depends upon some defect of nutrition."

The peculiar functions of this gland, as set forth in the preceding pages, of organizing fibrin cells and filaments, and other blood products, explains why it is one so subject to enlargement and induration, by any cause, which prevents free circulation through it while its organizing processes are actively going on.

Softening and induration of this organ evidently depend upon a change in the constitution of the blood or coagulated fibrin which fills the splenic cells. In softening, the blood is so thin as to admit of being thoroughly washed out of the cellular parenchyma. Sometimes it is perfectly fluid, and gives an obscure feeling of fluctuation. Softening may be attended with diminution or enlargement of volume—the latter is common after protracted typhoid fevers. Analogy leads us to believe that inflammation may be one of the causes of softening, but a more frequent cause probably is an *alteration of the whole mass of the blood, since it is principally in typhoid fevers, scurvy, &c., that softening is observed.* (Hope's *Princ. and Illust. of Morb. Anat.*) The cause of the change in the blood arises from deranged function of the parent fibrin cells in the arterial extremities. We can readily perceive how it is, that the blood of the body may become thin (deficient in fibrin) as soon as the functions of the spleen are partially or wholly suspended. This being the gland which organizes fibrin more largely than any other, if its functions in this respect be suspended by the blocking up of the tubular glandules and oval splenic bodies with partially organized fibrin, one great source of this product would be cut off from the blood. The fibrin already in the blood would become deposited in the tissues, and one important source being cut off, the blood would become necessarily thin and deficient in fibrin or clot.

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[1] As an evidence that these are cell products undergoing morphological changes, and are in transit and not connected at all with the elements of the spleen, we here refer to the simple fact that, in a few days after death, even when the spleen is removed from the body at death and preserved carefully in alcohol, these cell products of the so-called *splenic cells* (*oval splenic bodies*) have become entirely transformed into highly transparent filaments, and entirely disappeared. This would not be the case with any fixed organic elements of the organ.

Whenever the whole mass of the blood of the body becomes very abnormally thin, we may look to the spleen for the primary lesion; that is, for the obstruction or other derangement of the fibrin manufacturing glandules of this organ.

Alex. Tweedie, in his work on *Diseases of the Digestive, Urinary, and Uterine Organs*, says: "Our ignorance of the function, or functions which the spleen is destined to perform in the animal economy, supersedes any attempt to apply to its diseases the distinction into those that are functional and those that are structural. We may, therefore, turn our attention at once to the structural affections of this organ, including those in which there is simply a disturbance of its circulation, and those in which its nutritive secretion is morbid in respect to the quantity or the quality of its products.

These remarks can no longer be applicable to this gland, since now its functions and structure are perhaps more thoroughly made out than those of any other gland in the human organism. In all those diseases where either the fibrin or red globules of the blood are abnormal in quantity or condition, the pathological lesions or derangement will be better understood, the diagnosis more satisfactory, and the treatment may be reasonably expected to afford more satisfactory results. These subjects will be all considered in detail, in another paper, *On the Pathology, Symptoms, and Treatment of Diseases which are either the Consequence or the Cause of Splenic Lesions.*

Some of the interesting symptoms of diseases of the spleen, as given by Dr. Twedie, are: "*Depression of spirits, torpor of mind, inactivity of body, with much muscular debility; deadly paleness, or a yellowish hue, tending more to black or green than in diseases of the liver; great liability to hemorrhage from various regions of the body, to dropsy, to dysentery, and to ulcers of the legs.*"

The spleen is liable to take on a morbid condition in continued fevers, as well as in intermittents. Diseases of the head, stomach, and liver are liable to be accompanied by diseases of the spleen. *The spleen is more liable to be affected with disease in damp, marshy localities than in other situations. In intermittent fevers there is a diminution of red globules and fibrin. Softening and the breaking down of the spleen is common in intermittent and continued fevers, in scurvy, and in some varieties of malignant dysentery.*

Here we have symptoms and lesions of the spleen concisely stated, which are of great interest and value in this connection. By understanding the true functions of this gland, they are all readily traceable to their true cause. The depression of spirits and torpor of mind may arise from a defective or suppressed organization of nutrient nerve products; inactivity of body and muscular debility from a defective organization and supply of fibrinous materials for the support of the muscular tissue; the yellowish hue, tending to black or green from defective organization, and supply of red globules and their attendant products; the great liability to hemorrhage from various regions of the body, to dropsy, dysentery, &c.; from thinness or thickness of the blood, and a defective supply of its normal products, and a laxness of all the tissues.

The reason why the spleen is so liable to take on a morbid condition in continued fevers, as well as in intermittents, is that the exciting causes of these classes of diseases affect primarily the epithelial tissue, and have a tendency to derange those portions of it most, which are the most actively engaged in organizing nutrient products; the reason of which appears to be that the exciting causes exist alike in the materials we eat, drink, and inhale, and absorb through the skin.

The probable cause of the spleen being more subject to disease in damp marshy localities than in other situations, is that in the former districts miasmatic poisons impregnate more or less the air, the water, and the food. The diminution of fibrin and red globules in the blood of intermittent fevers is caused by a greater or less suppression of the splenic functions in this disease. The so frequent induration, softening, and breaking down of the spleen in intermittent fevers, scurvy, and in some varieties of malignant dysentery, arises from the peculiar functions of the gland and its liability to become deranged in structure and function, when exposed to the malarious and other exciting causes of these diseases.

Leucocytosis.—This is a disease of the lymphatics, and like leukæmia is indicated by an increase above the normal standard of the colourless corpuscles of the blood, and a decrease in the blood disks. It is distinguished from leukæmia by the colourless corpuscles being shrunken, shrivelled, small, and ragged, while in leukæmia they are plump, larger, and more perfectly spherical. In this disease the lymphatic glands are the organs implicated, while in leukæmia the spleen is the suffering part. Both diseases may be either functional or organic. They may occur singly or combined. The microscope alone can settle this question.

These investigations explain the pathology of this disease, as they do that of leukæmia. In another paper on the structure and functions of the lymphatics, it will be shown that these glands are analogous in structure and function to the spleen; the difference being merely that in the former *white blood circulates—while red blood circulates in the latter.* That in the former the tubular glandules are the arterial extremities of the lacteals, and lymphatics in the lacteal and lymphatic glands. That in these glands these tubular glandules terminate in capillary vessels as in the spleen, and that the arterial capillary and venal vessels of the lymphatics have the same structure as the arteries, capillaries, and veins, that carry red blood.

Leukæmia of Virchow, or Leucocythæmia of Bennett.—This is a disease first carefully studied and named by *Virchow.*[1] It is characterized by a continually augmenting increase in the colourless blood corpuscles, and with this increase a diminution of the coloured blood disks. In the healthy blood there is about one colourless corpuscle to every 300 blood disks. In this disease, the former goes on increasing, and the latter diminishing till the colourless corpuscles equal and often exceed in numbers the red corpuscles. Virchow states that in the histories of all the known cases of the disease, we find it only once as yet recorded that the patient, after he had been for some time the subject of medical treatment, left the hospital considerably improved in health. In all the other cases the result was death.

The cases described present this remarkable peculiarity, that towards the close of life a genuine *hemorrhagic diathesis* is developed, and hemorrhage ensues from the nose and often in the brain and intestinal canal.

Virchow further says that upon investigating whence this curious change in the blood takes its origin, we find in the great majority of cases that it is a certain, definite organ, which presents itself over and over again with convincing constancy as the one essentially diseased; an organ which frequently, even at the outset of the malady, forms the chief object of the complaints and distress of the patients, namely, the *spleen*. In addition, a number of the lymphatic glands are very frequently diseased, but the affection of the spleen stands in the foreground.

The primary seat of this disease hence appears to be the *spleen*.

The symptoms of this disease in this connection are not without interest. They are briefly as follows: increase in colourless corpuscles of the blood and decrease in red globules; enlargement of the spleen; pale, waxy appearance of countenance; lips pallid; cellular tissue soft and pulpy; muscular and nervous debility, and torpor of mind and body. Towards the close of life there is a peculiar tendency to hemorrhage from both mucous and serous surfaces.

The interesting and important glandules and newly-discovered functions of the spleen, as determined by these investigations, throw valuable light upon this disease. The functions of the tubular glandules appear to be over active, while the fibrin cells organized by them are retarded to a greater or less extent in their metamorphosis into fibrin filaments and blood disks; hence results the deficiency in the coloured globules and fibrin, and the resulting pale waxy hue and general torpor of mind and body, and the constant increase in the colourless corpuscles as the disease progresses.

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[1] Dr. Bennett, of Edinburgh, has described a case, without naming it, in the Oct. No. 1845, of the Edinburgh Med. and Surg. Journal, which was about six weeks previous to Virchow's description of the disease. This should entitle him to the credit of its discovery.

Virchow says the spleen is a remarkably sensitive organ, which swells not only in intermittent and typhoid fevers, but also in most other processes in which noxious infectant matters have been freely taken up into the blood.

The spleen is enlarged in melanæmia. In this disease a condition exists somewhat allied with that of leukæmia; since we have in it to deal with elements which, like the colourless corpuscles in leukæmia, make their way from definite organs into the blood and circulate with it. Meckel found that in this disease the spleen was invariably enlarged and pervaded by black pigment, and he therefore ascribes the change in the blood to an absorption of coloured particles from the spleen. The pigmentary matter of this disease is believed to be developed in the spleen. The occurrence of the pigmentary matter in the blood is supposed to be always due to affections of this organ.

I have here briefly thrown together a condensed statement of my labours connected with the spleen, and have introduced only a small portion of the more important illustrations; yet enough, I trust, has been given to convey a tolerably clear idea of the subjects discussed and of the extent of the labours.

ART. II.—*Account of the Epidemic of Yellow Fever which visited Pensacola Navy Yard in the Summer and Autumn of* 1863. By B. F. GIBBS, M. D., Surgeon U. S. N.

IT is not proposed in this article to write an elaborate essay upon a disease which has been known, as a malady most fatal to human life, for a hundred years. To scrutinize facts which have been exposed to the medical public in every manner best suited to determine the hidden mystery of the nature, cause, and treatment of the disease would be equally unprofitable; but it will not be amiss to offer a few facts collected on the field of pestilence, that may help to remove a prejudice or unveil a mystery.

It would be an easy matter to fill many pages with conflicting opinions regarding the origin and character of this dreadful disease. But after steadily probing the obscurities and combining the statements and facts selected from a thousand sources, all have been obliged to rest in the field of research dissatisfied with their incomplete and unsuccessful labours. Not as a theorist, but as a contributor of some observed facts, which I trust will be useful in themselves, as such, I offer the following observations:—

It is necessary to remember that the scene of this epidemic at Pensacola, Fla., was under the most complete military control. No ships entered the harbour of Pensacola, or moved while in the harbour, neither did individuals pass from point to point without the knowledge of the military or naval authorities. For this reason the history of all those cases which might have been considered isolated was easily obtained, and also whether any connection could be traced from them to the point of infection, or whether intercourse existed between the latter and those neighbourhoods which were healthy.

Origin and Progress.—August 25, 1863, was the warmest day experienced during the period of the epidemic; the thermometer stood at 12 M. at 92° Fahr., and for some days previous to the outbreak of the disease the thermometer approached this high figure. Commodore Wm. Smith called me to go on board the U. S. Store Ship "Relief" and inquire into, and report upon the cause of an unusual amount of sickness from which the whole of this ship's company were suffering at that time. The disease had appeared very suddenly in this form (according to the statement of the assist. surgeon in charge, "in its present severity"), and a general state of alarm prevailed. The ship was recently from Ship Island, a perfectly healthy locality, where she had been used as a store ship for the previous thirteen months. No unusual amount of sickness had prevailed in the ship previously; she had passed the quarantine about two weeks before, and was reported "all well" to the health officer. About three days, however, before I visited the ship the medical officer, Asst. Surgeon Peck, asked my advice in regard to the treatment of some two or three cases of what he called obstinate intermittent fever, and complained that they did not yield to quinia. He increased the dose as I advised him, and reported afterward satisfactorily.

The onset of the disease among those I saw on the morning of the 25th, was of a severe character; reaction slow, imperfect, or entirely wanting, indicative of a low and malignant form of disease. From the condition of the hold of the ship and other circumstances, and for want of a better name, I reported the disease as typhus fever, contagious, and urged an immediate quarantine. At that time, from the symptoms, it was impossible to make the certain and correct diagnosis which I was enabled to do in a few days—the course of the disease deciding the question.

Seventeen of the worst cases, in above thirty affected, I sent to the small hospital in the navy yard, the few cases of casual disease being removed, fearing the spread of disease by contagion, which I conceived to be strong, from the rapid spread of disease in the ship. At the end of five or six days all these cases were convalescent but one, which terminated fatally, exhibiting all the symptoms of yellow fever, including the hemorrhage and black emesis. The treatment of these cases will be given in what follows. It is necessary to remark that these cases were seen immediately, and the active remedies administered were most satisfactory in their results. Of the cases left on board, some of them recovered with a jaundiced skin and much debility. After the "Relief" was quarantined seven or eight cases on board immediately grew worse, and in six days seven deaths were reported in the ship, including the medical officer, Asst. Surgeon Peck, who stood heroically "in mortal conflict with the destroyer," and yielding his life a sacrifice to humanity, deserves that entire and generous praise, which can scarcely be bestowed on him who falls by the hand of his fellow man in more brutal combat. All these cases were the most decided and very malignant yellow fever.

Sept. 1. The epidemic until this time seemed to have been circumscribed to the "Relief," which was in quarantine six miles distant. The vessels lying adjacent to the yard were perfectly healthy, and we hoped to see no more new cases. Suddenly two of the officers of one of these, a merchant vessel, the "Myrover," were taken and died within three days, having been slightly indisposed two days before the onset of the fatal symptoms.

The vessels of the bomb-flotilla now became more sickly, from one to three cases occurring daily. Fearing almost any disease that was accompanied by fever, I had them all removed to the quarantine, and visited them daily in a steamer.

Although it may be said that this must have been a useless proceeding after those cases had been treated in the hospital and proved to be yellow fever, it will presently appear that the removal of the "Relief," the original point of infection, to quarantine and this flotilla also, secured those in the navy yard, a month after the outbreak, and those first cases were treated from the "Relief" in the yard hospital; showing the feeble power of the disease to reproduce itself at a distance from the point of infection within a month after its appearance. All the men of this bomb-flotilla had been the subjects of malarious poison during their service in the Mississippi River, were then suffering, and were consequently far below the standard of health in vitality. For this reason every one of the flotilla lost many men after the universal spread of the epidemic, notwithstanding our earnest efforts to localize it. It has been said that yellow fever is only an aggravated form of marsh fever, and we know one attack of the former is considered as granting future exemption, while it does not hold good in the latter, although it is a step toward acclimatization. So far as a similarity of the diseases is concerned in bestowing an exemption that would prove an identity, we have no support in the history of these bomb-vessels, for those sufferers from the Mississippi malaria were the most constant victims of yellow fever.

All of the vessels in the harbour were now in strict quarantine five miles distant, and the men belonging to them removed to the shore where they were made comfortable in tents constructed of sails.

22*d.* The first case appeared again in the hospital in the navy yard, which had been thoroughly cleansed and painted since the last case was treated there. The case proved fatal on the succeeding day, with decided symptoms of the fever. The cases at the Quarantine Hospital were now less malignant, many were convalescent, and no new cases had occurred for several days.

29th. A strong wind blew from the north, which lasted three days. The thermometer fell several degrees: we were unable to visit the quarantine across the bay; the wind increased to a sweeping gale; at its close I visited the island, and found all convalescent and no new cases. I removed tents, sent those to their vessels who were well, and removed those much debilitated to a tent for convalescents in the navy yard.

In the mean time, between the 22d and 29th inst., the disease seemed to have localized itself in the navy yard, without spreading to the army encamped only one and a half mile distant. The villages adjacent to the yard contained now and then an unacclimated person who fell a victim to the destroyer. These villages were remarkably clean from the fact that a year previously they had been evacuated and partially burned. The army devoted especial attention to the police of their locality, and enforced absolute quarantine by a double picket line. Several times a week every part of their neighbourhood and encampment was thoroughly cleansed; and situated as it was on a high sand bluff, nature contributed much to secure the soldiers from an invasion of the pestilence. At the close of the epidemic two mild cases were reported. In the navy yard, the marine guard now exhibited a sick list of 25 men; four had died, a number were treated in the hospital, besides the milder cases which were treated in quarters or required no treatment at all. One of the marine officers died and two others recovered after a most critical illness, which left them in a condition wherein their constitutions were terribly broken down: one of these officers recovered after having "black vomit."

Simultaneous with the appearance of the epidemic at Pensacola (August 25), a similar malady invaded the frigate "Colorado," forty miles distant on the blockade off Mobile; seven or eight of the cases died, as I have been informed, of about forty affected. They were unable to trace the disease to any other source than the probable fomites, with cryptogamia, or germs contained in stores received on board, coming from the "Relief," previous to her departure from Ship Island.

Now from the above history of the commencement of the malady there can seem little doubt that the disease was generated in the "Relief." Perhaps it is too positive to point to this locality as anything more than affording proper conditions for generating this poison, or fostering the germs in the same manner as certain protophytes only multiply when lodged on proper soil, as the germ of *Isaria felina* upon the dung of cats, *Puccinia rosæ* upon rose bushes, &c.[1] In the "Relief" we must have had, first, the germ; second, we had the subjects susceptible to its influence;

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[1] Carpenter on the Microscope, p. 341.

and third, we most certainly had in the hold of the ship conditions necessary for fostering the germ. This deserves attention as an important point in naval hygiene.

Stores had remained undisturbed in the vessel over a year. During this time several hundred gallons of sperm oil had leaked from the casks into the bilge. The ship made much bilge water, which was exceedingly offensive in its odorous gases, and very black. Kegs of pickles were mouldy or in a state of decomposition; and the fresh preserved meats in cans were unsound to such an extent as to give rise to an animal odour. When I first visited the ship the hatches were all closed, as the offensive odour with them opened was most intolerable. In consequence of these nauseating odours it was impossible for me to but indifferently explore the hold of the ship, and I was glad to again shut up the fomites of the fever under close hatches, with the conditions that gave them birth. Here we had what is usually considered sufficient to generate this disease, viz: heat at over 100° Fahr.; in the hold, salt water, animal matter in a state of decomposition, and the whole stirred up in the ship on the passage from Ship Island to Pensacola. That the disease did not appear earlier in the vessel than near two weeks after reaching Pensacola, may be explained by the fact that it did not feel the influence of sufficient heat until the time stated.

To the filthy condition of the "Relief" we trace the origin and initial point of the pestilence. Whether it was reared in her without the deposit of a germ is not of so much practical importance as to fully understand the fact that the *nidus existed* in her to nourish the fatal malady.

Another fact strictly follows here, which does not disturb those theorists who believe in epidemic germs. We were forcibly impressed with this in observing that when once we had a nucleus in the "Relief," it was not necessary that we should have the same conditions of filth abroad to encourage a spread of disease in the neighbourhood. On the other hand, in the navy yard and on board a few of the vessels in the harbour, cleanliness was most thoroughly observed, and seemed a feeble barrier to the disease. I leave it to those who choose to theorize upon the subject, whether such as suffered under the latter circumstance were the victims of organic zymotic poison carried through the air from ship to ship, or whether a fomites containing the same was carried in the boat or in some manner escaping the scrutiny of the police.

But an excellent illustration of the broad epidemic character of the disease was in the death of a girl in the town of Pensacola, outside of the Union lines, six miles distant and with whom all direct communication from the positive locality of development was impossible. The case was undoubtedly one of yellow fever, as Dr. Brozenham, who has been living and practising there fifty years, gave me the information after the close of the epidemic fever. This case occurred after a more general spread of the disease.

The *symptoms* of this disease have been so often described that it would seem a repetition of no value to do so again. My object in doing so is, that they may be referred to the treatment, which was practised with some success, and that one may be enabled to judge whether this was a mild or severe form of the disease. The usual symptoms of fever occurred in this disease, but they were of a low and severe character. If a novice examines a case accurately, he distinguishes at once the typhoid severity, the mental hebetude, the red or injected eyes, in bad or hospital cases, unlike ordinary fevers. The cold stage or period of invasion was or was not ushered in with alarming symptoms which required the most anxious attention, while our facilities for treating a large number of sick were limited. This stage bore no direct relation to the subsequent fatality of the disease. In this condition the patient had a cold clammy skin, dilatation of the pupils, hebetude, and semi-comatose condition of the brain, often tonic convulsions with severe pains in head and back, which in bad cases were displaced by delirium and all the symptoms of great prostration which rapidly followed. The febrile reaction which succeeded this condition was more perfect in favourable cases. In the worst cases this reaction was always imperfect and in some absolutely wanting. No medication was available unless the fever was well formed. The fever pulse was not more than eighty per minute, and easily compressed, but full. With reaction well established, the skin was hot and dry, and attended with extreme thirst, and pains in the head and back. It might be said that some cases died in the period of invasion without ever reacting; but such as these laboured before, often unconsciously, under a mild form of the disease, which lingered undeveloped until some exciting cause, as a change of temperature, reduced the vital forces, and enthroned the poison of the epidemic more decidedly, so that life yielded to its dissolving influences. The tongue in the febrile condition was coated at first with a white moist coating of a creamy colour, which inclined in a day or two to a brown or mahogany colour. In fatal cases this turned rapidly to a dry black crust, which cracked and allowed the blood to flow during the hemorrhagic tendency. The fever lasted from three to five or eight days; not continued, but intermittent at irregular periods as the powers of life and the violence of the disease varied in their relative intensity. Great determination and fortitude on the part of the patient, with faith in believing he was able to withstand the violence of the disease, was favourable toward continuing the febrile condition, and averted the collapse which was so common at any moment in the course of the disease. Fear of a fatal termination and alarm at the symptoms of adjacent patients were always disastrous, and hastened the fatal issue.

In mild cases the fever ran its course in from one to six days, always leaving a state of great debility, and the skin of an orange hue. The fatal symptoms of bad cases were usually exhibited before the fifth day; in fact we were in the habit of saying that the patient was in fair way to recover if he survived the fifth day.

There were other symptoms which occurred in the course of the disease that were not present in every case. Among these was the *hemorrhagic tendency*, in which blood flowed from one or all the mucous passages; commonly from the nose, mouth, or eyes; sometimes from the ears and rectum, and more rarely from the penis, or vagina in women. *Black urine* was in our experience a very favourable symptom, more so than the black fluid dejections. All the cases which exhibited this symptom recovered, three of which were having *black vomit* at the time; great emaciation and debility after recovery, with a jaundiced skin for the time, effectually impaired the health to an alarming degree.

The *chemical* and *microscopical* characters of the urine and matters vomited received enough attention to verify or disprove some of the many statements given to the profession in regard to the changes so constantly exhibited. The urine in all the cases was highly albuminous and strongly acid: often the coagulation was spontaneous and the albumen fell a thick mass at the bottom of the urinal; of the true secretion there was little or none; the black vomit was always strongly acid and not infectious. One of the nurses received the whole of the matters vomited in his face, and his mouth being open some entered it, with no fatal consequences, although he suffered subsequently from the fever. The microscope reveals many curious characters in the different morbid productions, when examined in the recent state, but do not lead materially toward determining the true nature of the disease besides exhibiting destruction of tissues. It has been declared that microscopic animals have been discovered in the black vomit. I have examined over a hundred fresh specimens under an instrument magnifying 600 diameters, but have not discovered them. For the purpose of obtaining a wider field I observed many fresh specimens with a less power, and with the same negative result. The matters vomited, as well as the black urine, consist of many heterogeneous parts. Among the most prominent of these, in the above morbid products, were altered blood corpuscles, which might be occasionally distinguished by the dark ring and lighter centre; but a perfect one was seldom seen. There was no regularity among them in the field of the microscope as in the freshly-drawn blood. Large masses of tissue were constantly seen in the matters ejected from the stomach, through which the capillary bloodvessels ramified; also the epithelium of the stomach and fibrinated patches. The larger capillary bloodvessels were sometimes seen with their walls, and blood corpuscles in them, entirely detached from the disorganized tissues. The mucous tissue was exhibited in large quantities, and was readily distinguished by its pavement epithelium. Those peculiar objects observed by microscopists were well marked in the recent matters vomited, or in those specimens in which the dry "vomit" had been moistened. These were oblate-spheroidal bodies, with dark concentric circles, having opalescent centres or nuclei, and are supposed to be an altered condition of the gastric juice: for what reason I am unable to divine. They are visible under the microscope when dry, but not a tenth of the size of those found in the recent matter vomited. The true nature of these bodies has not been determined. They were constant, and always occurred entangled in the fibrinous matter.

The dark masses found in the vomited matters at every change of the objective field, and which gives the colouring to this matter and to the urine, resembled black wool as the latter appears to the naked eye, and was evidently some carbonized substance, which is ill-defined and its explanation equally obscure. Highly carbonized colouring matter of the bile sometimes assumes a dark colour, perhaps from an excess of purpurine which remains uneliminated by the kidneys.[1] Urine passed later in the history of some cases when the renal secretions were more active we know presented this same black pigment under the microscope, and as we have said was a favourable symptom for the relief of the stomach. Whether or not there was a mutual reaction in this black matter between the stomach and kidneys I am unable to say; but one of the strongest indications in the treatment of the disease in our experience was to re-establish the renal secretion if possible. Whatever this colouring matter may be, whether the poisonous purpurine, hæmaphæin, hæmatosine, melanourine, or a mixture of these in some way, it forms the bulk of the matters ejected from the stomach and gives it the colouring so pathognomonic of the disease.

Treatment and its Results.—If the patient was seen upon the appearance of the first symptom and was strong and previously healthy, a full dose of calomel and jalap was administered: under opposite conditions, ol. ricini was by far the best purgative. The treatment pursued in the cases first sent to the yard hospital from the "Relief," was commenced with calomel and jalap pulv. āā gr. x. This was followed all around by quinia sulph. gr. xx. Of these cases all recovered but one, and they received no medication besides the above. Another case I will venture to record, showing the *treatment*, and which, from its long and critical character, was interesting:—

Lieut. S——, U. S. Marine Corps, was attacked with a severe pain in his head and back, and was given the mercurial purge. After this I gave him quinia sulph. gr. xxx, and watched him carefully in his nursing. His case assumed a lower and more malignant form with intense thirst. Gave him potass. chlor. ʒj, in aq. f℥viij, in which was placed a piece of ice; this was taken *ad lib.* Dry heat was applied steadily by bottles of hot water in a room of an equable temperature. Delirium and the graver symptoms continued to be manifested. Applied ice to his head and continued unremittingly the dry heat. Upon the disposition which appeared to bleed from the nose and mouth he was placed upon the solution of persulphate of iron, gtt. v, every two hours; this remedy acted in this as in many other cases in a manner eminently satisfactory. Upon the discontinnance of the latter remedy he was placed upon muriatic acid, five drops every three hours until ordered north for recovery.

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[1] Bird on Urinary Deposits, p. 169.

Whether the quinia, given in this case, at once directed it to a favourable issue by an influence exercised upon the ganglionic centres, I cannot say. But another young officer, more robust in health than the above, surrounded by precisely the same influences, was taken about the same time; he took no quinia, and died. Many other cases might be recorded, in which circumstances prevented the early use of quinia in large doses, which rapidly succumbed to the intensity of the epidemic. We cannot say that by this use of quinia these cases might have been saved, but severe cases recovered in which it was used. That sulph. quinia is not of any use after the violence of the disease is fairly established, I am fully convinced; as an illustration of this there was the case of a citizen, not under my care, however, who took no less than sixty grains of quinia sulph., in divided doses, through the day, but the result was fatal. This patient was then in that condition when delirium had made its appearance, and the sclerotica was densely injected.

Through the course of the disease, ice was most steadily administered, to relieve the great thirst, and with this the beverage of solution of potas. chloras. With the constant application of heat these remedies were certainly useful in the worst cases, but it was necessary to abandon them instantly when the fever abated. Sinapisms to the legs and epigastrium, and blisters to nape of the neck, when the head symptoms threatened, were constantly used. Hot mustard baths, when the apartment was of proper temperature (which could not always be obtained), were very useful. In the application of heat it is most desirable that there should not be a change of temperature of even five degrees. Upon the whole, we found that bags of hot sand and bottles of hot water placed under the blankets were best suited to external stimulation.

Any plan of treatment which does not make heat an important part will fail; even while fever exists it seems beneficial, and excites diaphoresis to the great relief of the patient. In all bad cases we assigned one nurse to each patient; women were employed because more attentive and careful. If by neglect of prescribed measures the skin was allowed to cool, this condition was quickly followed by retching and vomiting, but the renewal of the heat always corrected it, for a time at any rate. Many lives were undoubtedly saved by this plan.

Any hemorrhagic tendency was well treated during the course of the disease by the tr. chloride of iron or solution of persulphate in five drop doses, frequently repeated according to the urgency of the symptoms, and was usually well tolerated by the stomach; if not, enemas were resorted to. Clysters of ol. ricini and ol. terebinth. were used to free the lower bowels. As a stimulating diuretic, turpentine was useful either in shape of the oil internally, or turpentine plasters to back and loins.

Mercurials in this epidemic, except as purgatives, were not indicated, although given with a view of producing a decided effect. In fact, any plan of treatment which was not stimulating, almost from the beginning, was positively injurious.

Muriatic acid as a tonic measure was our chief reliance, and seemed in the whole course of milder cases to be most beneficial; almost every case during some part of its course was under this treatment, and I cannot but believe in its virtue. It was given in as high as ten drop doses every hour, and was well tolerated by the stomach.

To conclude, we have positive evidence that quinia given sufficiently early has a remarkably controlling influence, from the fact that nearly every case that became thoroughly under its influence recovered. We have negative evidence of its value in the fact that the vast majority of fatal cases were not influenced by it, in consequence of the stage of disease when they came under our notice, and very many of them died.

The result of our treatment was eminently satisfactory compared with that in other epidemics, and in consideration of the fact that all these were bad cases; for only the worst cases were sent to the hospital for treatment. We received about 260 cases; 58 deaths of this number were recorded. This is something less than 25 per cent. of deaths, and all of the cases were severe.

Preventive Measures.—Most perfect cleanliness is necessary, although at Pensacola it did not prevent the invasion of the disease when men were suitable subjects. Usual habits should not be departed from, and above all it is most necessary that clothing should be as thick as is compatible with comfort; under clothing should be worn fitting tightly to the skin. The spirit ration or regular stimulation which has become habitual should be continued in moderation. Equable temperature, and a control of all the intellectual faculties, tend to ward off the disease. A firm determination to resist, and forgetfulness of the surrounding pestilence as much as possible, increase the security. The depressing influence of the heat of the sun should be avoided, although recreation is necessary. Cleanliness of person, cool retreats, with agreeable society, add strength to the resisting powers. Negroes are more exempt; some of them were affected so far as to suffer from the head and back pains. Good food, nourishment in variety, and full command of the comforts of life, tend to preserve the health. Medication as a preventive measure is injurious. One attack gives immunity to the disease, as a rule. Quarantine is useful if far distant and absolute. Such in our experience were the measures of greatest value, and I should adhere to them as strictly as possible if called to pass through another epidemic.

Of the *exciting* or *predisposing causes*, we might mention that the measures just enumerated as affording the best chance of escape, if neglected, act as exciting causes. But changes of temperature are first and strongest. Latent yellow fever, as is the case with miasmatic and other fevers, was influenced by increase of cold. Between Sept. 19th and 22d there was a fall of the thermometer of about 12° Fahr., and fifteen patients died. Between Oct. 6th and 16th there was a reduction of temperature of from 12° to 16° Fahr., and seventeen cases died. Between these periods of time, when the general state of the thermometer was high, an average of about 85° Fahr., there were occasional deaths; but it was only when the temperature was steadily lowered for three or four days in succession that the cases proved rapidly fatal. The epidemic, although it was checked by the fall of the mercury, was more decided and fatal among those already affected. Cases apparently convalescent, upon such changes of temperature, assumed the most violent form, in the same way as fear and anxiety by reducing the nerve force expose the individual.

The totally or partially unacclimated suffered most. I have seen a debauch in several instances to so increase the susceptibilities of individuals that the next morning found them labouring under the disease, although the same persons had been daily exposed for weeks. These cases generally terminated fatally. Sexual excesses favoured an invasion of the disease; a clerk who had escaped during the height of the disease, toward the close of the epidemic became *placée* with a mulatto woman, and was shortly taken with fever and died. All those who contracted the disease in the early history of the epidemic had been within the point of infection, that is, on board the "Relief," from which, at first, the disease was supposed to be contagious. This was subsequently disproved by the broad epidemic character of the disease. For instance, those two cases which occurred in the army that was most absolutely cut off from the point of infection, and the case of the little girl in the town of Pensacola, which was within the enemy's lines six miles distant.

Great fatigue, constant watching, or exhaustive exercise are exciting causes. Physicians, amid the trials of the pestilence, should be careful to observe studied regularity of habit in body and mind; the obverse of this is an exciting cause. The exemption of medical officers during the severity of the disease can only be explained by the fact that we were too much engaged in responsible cares and the scientific interest of each new case to catch the alarm natural to those who avoided the hospital and only were cognizant of an unmitigated state of the disease, as they saw the cart filled with dead bodies in the morning.

I conclude from this experience that yellow fever may originate in a ship when we have heat continued for two weeks at 90° Fahrenheit, and the hold of the ship is filthy.

That we must have three conditions for its propagation, viz: First, subjects susceptible to its influence; second, the germ; and, third, suitable surroundings, as the filthy hold of a ship, &c., for the germ to thrive and multiply.

That quinia, if used sufficiently early and in large doses, will direct the disease to a favourable termination in many bad cases.

That a reduction of temperature of five degrees during the critical period will destroy the patient.

ART. III.—*Hospital Gangrene, as it occurred at Patterson Park, U. S. General Hospital, Baltimore.* By W. KEMPSTER, M. D., of Syracuse, New York.

HOSPITAL gangrene made its first appearance in the early summer months of 1864, shortly after the arrival of a large number of wounded received from the Army of the Potomac, *via* Washington; the men were necessarily crowded, and there was a lack of medical assistance, consequently it was impossible to bestow that care and attention upon them required in cases of gunshot wounds, especially during hot weather.

It was while the hospital remained in this crowded condition that the disease manifested itself, continuing in a greater or less extent through the entire summer and autumn, again making its appearance in December, four severe cases occurring in that month. In the entire number treated (between forty and fifty), constitutional symptoms presented themselves, in a degree which enabled the medical officers attached to the hospital to form a *prodiagnosis.* Most surgical treatises, and in the reports contained in the *American Journal of the Medical Sciences* for 1865, the constitutional symptoms, if mentioned at all, are regarded as *secondary*, or dependent upon the severity of the local disturbance; such, also, is the idea set forth in Prof. F. H. Hamilton's late work on military surgery. So far as my observation goes, however, this is not the case, all patients presenting the appearances to be described, with variations of intensity, from twelve hours to three days before the local effects are apparent. The first symptoms were usually headache, loss of appetite, general uneasiness, and lassitude; the tongue was often covered with a dirty grayish coat, sometimes it was glazed and dry; the skin was hot, and the perspiration checked; there was also considerable febrile movement; the pulse ranged from 90 to 120; the bowels were constipated, and it was usual for the patient to ascribe his illness to this cause; hence we were sometimes warned of approaching gangrene by a wounded man asking for a dose of physic, at the same time remarking that his head ached, &c. These symptoms increased in severity, until the disease had made its appearance in the wound;

they would then partially subside; the appetite returned, the pulse became fuller and less frequent, and the tongue cleaned up; by the time the local manifestations were subdued, the patients felt improved in health and spirits, but they were much weakened by the attack. The degree of constitutional disturbance was in a measure prognostic; other things being equal, severe prodromes indicated greater intensity of local morbific action; nor did a robust state of health, previous to their disease, warrant immunity from this law; when the symptoms above described were severe in character, and the patient presented a typhoid or adynamic appearance, the prognosis was not favourable to a mild attack, and these views were almost invariably borne out in the result. After this condition had continued for a longer or shorter duration, the disease announced itself locally, first, by causing a cessation of the discharge of pus, and the wound presenting a dry, glazed appearance; this was attended by a sharp gnawing pain, with a sense of tightness, or, as the patient described it, a "drawing sensation;" shortly after, the floor and edges of the wound were covered with the characteristic dirty grayish deposit, and upon the integument near the ulcer vesicles sometimes occurred, containing a thin ichorous fluid. The disease now rapidly attacked the adjacent parts, first destroying the cellular tissue, burrowing under the integument for a distance of from four to six lines; this distance being marked upon the epidermis by a livid areola; the skin was next broken down and destroyed. During this disorganizing process, the temperature of the neighbouring parts was very much elevated, thus undoubtedly causing more active decomposition, and the occurrence of an extremely offensive pungent odour, entirely unlike that caused by putrefaction; indeed it was considered diagnostic. Thus the disease progressed, until arrested by the means employed, or by death, which occurred in but three instances.

In illustration of the above described symptoms I will cite three or four cases; for the notes of two of them I am indebted to Dr. George W. Fay and Dr. Andrew McLetchie, of Baltimore.

CASE I. Levi Ostrander, aged 23, American, private Co. I, 84th Pa. Vols., was wounded June 6, 1864, and was admitted to hospital June 11th. The wound, which was caused by a minie ball, through the right thigh, upper third, anteriorly, was about two and one-half inches long, quite superficial, passing just under the integument, which sloughed in a few days, exposing the track of the ball, at that time covered with healthy granulations; when admitted he was perfectly healthy, of robust constitution, and fat.

June 20. Complained of headache, loss of appetite, and constipation; ordered a cathartic.

21*st*. Patient worse; physic operated once; headache; tongue is thickly coated; pulse 95; did not sleep well during the night; has a dull heavy expression, not unlike that presented by typhoid cases; he is restless; wound not discharging; ordered a mixture of quinia and acid. sulph. aromat. with morphia at night. Low diet.

22d. Wound has become gangrenous, and during the night has enlarged nearly an inch, being in all about two inches in diameter; the diseased portions were cut away, and all loose shreds removed; the wound was then thoroughly cleansed, by throwing on a stream of water, with a syringe; the parts were cauterized with strong nitric acid, and dressed with a poultice of pulv. sem. lini, carbo ligni, and resin cerate. He slept a little last night, but feels tired and weak; the symptoms are but little improved. Acid mixture stopped; ordered milk punch, two pints in the twenty-four hours, essence of beef ℥ij every three hours.

23d. Disease is not yet arrested; the wound is fully four inches in diameter, and an inch in depth; the integument, cellular and muscular tissues are destroyed; the gangrenous parts were removed, and the wound again cauterized with the acid; dressed as before.

24th. Wound is still increasing, it now being six inches in diameter, about one and one-half inches deep, and horribly offensive; it was again freed of sloughing material, and again cauterized, the swab being introduced as far as possible under the flap of integument, caused by the destruction of the cellular tissue; it was then dressed with the following: Unguent. potass. iodid. ʒj, cerat. simpl. ℥j. M. This was applied over every part of the ulcer. The patient feels better; pulse 90; tongue glazed and dry. Bowels regular; he is very weak.

25th. Slough has entirely separated, leaving a healthy looking floor and edges; the wound was washed with a weak solution of permanganate of potash. Stopped milk punch at his request, and gave him porter, two pints per day, with a nourishing diet.

From this time the wound improved satisfactorily; it was kept clean by washing it with castile soapsuds, and dressing with oakum; he rapidly improved in strength, and on September 10, 1864, the wound had healed, but the leg was weak.

In this case the constitutional disturbance was severe, and led me to think at one time that it would terminate in typhoid fever; he was full-blooded, temperate, strong, and hearty, but in less than two days he was compelled to keep his bed, which he did not leave for several weeks after the disease was arrested, and during its continuance he required a large amount of stimulus, to overcome the great debility.

Case II. John Cole, private Co. E, 4th U. S. Cav., aged about 35, American. Admitted to hospital June 11th, 1864; was wounded May 24th, by minie ball, in the anterior part of left thigh, upper third. July 8th, wound of exit entirely healed; wound of entrance nearly so: patient is strong and healthy.

July 10. Complained of headache, loss of appetite, and lassitude. Pulse rapid, tongue furred, perspiration checked, skin hot, febrile movement well marked; ordered a cooling laxative; the wound has taken on inflammatory action; is dry and painful.

12th. Well-marked gangrene has appeared in the wound of entrance, and has already destroyed the skin over a space two inches in diameter; the cellular tissue is eaten away for a distance of four lines beneath the integument, which is well marked upon the epidermis by a livid areola; cut away the diseased portion, and cauterized the wound with strong nitric acid; it was dressed with the potassa iodid. ung. Ordered milk punch, two pints in the twenty-four hours, and a nutritious diet.

13th. The slough has partially separated, but the wound has not a healthy aspect; reapplied the potass. ung. From this time the wound progressed but slowly, and he did not improve much until

17th. Gangrene reappeared on edge of wound; applied the acid to these spots, and continued the potass ointment. The patient is depressed, and thinks he will not recover; the wound is now three inches in diameter; part of the muscular tissue on the floor of the ulcer is destroyed.

23d. Wound is in a healthy condition; has continued to improve since last report; patient is very weak but improving. He subsequently recovered.

Here again the constitutional symptoms were well marked at least thirty-six hours previous to the appearance of gangrene, which was persistent; and the same marked depression of physical force was observed as in Case I.

CASE III. Charles G. Edwards, private H, Purnell Legion, was wounded June 18th, 1864, in second toe, left foot. The toe was amputated the day after the wound was received.

July 17. Was called to see him at his residence. He says the wound had nearly healed and he had felt comfortable until within a few days, when he experienced headache, loss of appetite, feverishness, and debility. Gangrene is now well marked, having spread about an inch in each direction. Applied ung. potass. iodid. to the surface of wound. Stimulants to be used freely, and a nourishing diet.

18th. The gangrene is still progressing; applied strong nitric acid, and dressed it with the above-mentioned ointment.

20th. Gangrene has disappeared save at one small point which was cauterized; patient quite weak.

21st. The disease has entirely disappeared; he suffered very little pain; physically he is much improved. Slept well last night which he has not done since the occurrence of the disease; he has some desire for food. He made a rapid recovery.

Another striking case will close the list.

CASE IV. Nelson Hollenbeck, private F, 7th N. Y. Heavy Artillery, was wounded June 3d, 1864; admitted to hospital June 11th. The ball entered the left leg at the junction of the upper and middle third, directly over the spine of the tibia; the bone was not shattered.

June 15. Complained of headache, loss of appetite, and constipation; he was ordered a cathartic.

17th. Patient is considerably worse; has a typhoid appearance, save only abdominal symptoms; tongue is thickly coated; pulse feeble and rapid; face flushed; skin hot and dry; has intolerable thirst; he is listless. The wound, which was healing nicely, is dry and painful.

18th. Gangrene has made its appearance in the wound; the diseased mass was removed with scissors and forceps; the parts were cauterized with nitric acid, and dressed with a poultice of pulv. sem. lini, carbo ligni, and ol. terebinth.

At this time, owing to the large number of wounded received, I was compelled to forego taking daily notes, and can give but the general treatment, result, &c.

The wound continued to enlarge notwithstanding the treatment, which was changed from time to time until all the remedies usually employed in such cases had been tried in vain. The acid was resumed, and on August 1st the disease was arrested. He had now a terrible wound, commencing about three inches below the knee; the disease had burrowed on each side of the tibia so as to expose nearly the entire circumference of the shaft for a distance of six inches; two large ulcers formed below the main wound each extending to the bone, so that in reality the wound extended from three inches below the knee to within about three inches of the inner malleolus, and at least two-thirds around the leg, a vast suppurating unhealthy ulcer. The bone was also necrosed.

Throughout this severe attack the patient continued to present the typhoid appearance mentioned above. Milk punch and brandy were freely administered, and concentrated nourishment was given. Muriated tincture of iron was prescribed in liberal doses; diarrhœa supervened, however, and on August 26th death ended his sufferings.

Of the two other deaths mentioned above, in the one case the disease attacked a gunshot wound near the right ankle inside, and was not arrested until the articulation was fully exposed, even the tendo-Achilles and the articular cartilage being destroyed. Some time after the arrest of the disease the foot was amputated, but the patient died two weeks after the operation was performed.

The other case occurred in the month of November, erysipelas attacking the wound after the gangrene had disappeared, to which the patient succumbed. It should be observed that both these patients had severe prodromic symptoms.

The *duration* of the disease in the aggregate was three days; the one prominent exception being Case IV., which occupied forty-two days.

The local *treatment* has already been indicated; the acid answered in all cases; other means were tried, turpentine, bromine, permanganate of potash, Labarraque's solution, sugar, &c., but none of these were as satisfactory or so much relied on as the acid. Great attention was paid to cleansing the parts thoroughly.

Internally tonics and stimulants were given, milk punch, brandy mixture, and porter being chiefly used; the tonic usually given was the muriated tincture of iron. Morphia was given to ease pain and procure sleep. Other indications were met by their appropriate remedies.

The *hygienic* treatment consisted in removing the patients to hospital tents erected for the purpose and situated about 250 yards from the hospital buildings, where they were treated during the continuance of the disease. After its eradication they were not transferred immediately to the hospital wards, but sent to other tents provided especially for this class of patients. All proper precautions were taken to guard against the spread of the disease, each patient being supplied with his own sponge, bowl, and towel; the bandages and other appliances were immediately burned after their removal.

In the disease as thus observed, there are some of its features which present themselves in so strong a light to my mind, and which go so far towards controverting the idea that this is purely a local disease, that I cannot entirely divest myself of the thought that it is in great measure constitutional. The cases would seem to distinctly indicate this. I repeat, that all the cases exhibited the symptoms described *previous* to the local appearance of the disease; we cannot regard them in the many individuals treated as merely coincident.

The sudden overwhelming of the vital force would indicate a powerful blood poison, and cases are not wanting in which the disease is reported to have appeared, during an epidemic, upon unbroken parts which have not been brought in contact with the debris of a gangrenous wound; the disease first making its appearance in a vesicle, the parts then taking on phagedenic action and being rapidly destroyed—certainly an indication of vitiated blood. Again, crowding seems to offer favourable conditions for its propagation, this fact being commented upon by most of the recent writers on military surgery. In fact, most of the conditions regarded suitable to kindle disease consequent upon blood poison have a direct bearing upon the production of this, thus giving greater force to the probability of its being constitutional. I think that no one is ready to assert that this disease is not most likely to appear first in crowded hospitals. Why crowding *wounded* men together is liable to produce hospital gangrene I am not prepared to say; neither can I answer why crowding healthy men produces a disease known as "crowd poisoning;" but that such is the fact I firmly believe.

It is not many years since diphtheria, cerebro-spinal meningitis, and other diseases having local morbid conditions, were considered local diseases. There are some who regard them so at present, but the majority of the profession, I believe, now class them among constitutional diseases with local manifestations. May it not be thus with this disease?

I am not prepared to say *positively* that hospital gangrene is a constitutional disease, but from my observation of it I must say that my preconceived ideas of its being entirely local in character are very much shaken.

Syracuse, N. Y., January 29, 1866.

Art. IV.—*On Ether as a Local Application.* By John J. Black, M. D., of Philadelphia.

Our attention was drawn to this subject by an article in the Quarterly Summary of the number of this Journal for Oct. 1864, p. 523, on the "Pathology and Treatment of Aphthæ." The author of that article, Dr. Jules Worms, whose paper originally appeared in the *Gazette Hebdoma-*

daire, concluded from a minute examination of the deposit on the surface of aphthæ, that it consisted of a fatty matter which is not to be found in any other disease of the mouth, and he inferred from the solubility of the exudation in ether, that this article might prove a useful remedy for the affection. Accordingly he resorted to the application, and with the most beneficial results. This remedial agent removes, he states, "the yellowish secretion, a new epithelium promptly forms, and no trace of the superficial ulcers remains beyond slightly increased vascularity of the mucous membranes."

Prompted by this statement, I determined to give the remedy an extended trial, and I shall now endeavour to show, by the results, that ether locally applied is a most efficient remedy not only in aphthous ulcers but also in most of the other diseases of the mucous membrane of the mouth and adjacent parts, in which, according to the researches of Dr. Worms, the deposits are of a non-fatty nature.

Aphthæ.—We have used the application in several cases of this disease, and invariably found the affection to yield after a few applications, daily repeated. A camel's-hair brush was dipped in ether and applied freely over the parts; it appeared to smart a little at first, but great relief soon followed. This was certainly marked both in character and point of time, in comparison with that obtained by borax and similar preparations.

"*Thrush.*"—In this disease above all others we have been pleased with the results of the application. The cases presented themselves in the obstetrical wards of the Philadelphia Hospital, Blockley, which of course were fruitful in that disease—containing so many badly nourished children. It was applied directly to the parts, as in aphthæ, with a camel's-hair brush. At first it produced or seemed to produce a slight difficulty in inspiration, which was soon relieved by a hearty cry of the infant. Of course its presence in the mouth could not have been pleasant, but in no case was it followed by an unpleasant symptom. The deposit was not immediately dissolved, but seemed to disappear gradually, and in most cases after twenty-four hours there was none whatever to be seen, and the one application completed the cure (at least the local cure). In other cases a few spots remained, and if they persisted after another twenty-four hours we repeated the application, and in every instance a cure resulted. These cases were all carefully watched, some of them for several months, and in no case was there the slightest return of the complaint. In from three to four days the mucous membranes became perfectly normal; in the interval from the disappearance of the deposit to this time it presented something of the appearance of erythematous stomatitis without the usual dryness attendant on that affection. Between twenty and thirty cases were treated in this manner, and after the disappearance of the thrush they improved wonderfully. These results tend to strengthen the idea that thrush is a local disease confined to the mouth, or at least that this part only causes inconvenience, and the constitutional troubles as it were radiate from that centre.

"*Ulcero-Membranous Stomatitis.*"—In this disease we have had the opportunity of testing it in three cases. One supervening upon pleurisy died with extensive sloughing of the parts of the jaw involved. Another recovered without any serious trouble, and seemed to have been greatly benefited by the ether. The third case, more serious, also recovered. Here the parts were apparently in a gangrenous condition, and it only differed from true gangrene of the mouth in commencing in, and being more particularly confined to the gums, without seriously involving the cheek. The sloughs were kept well detached, the parts washed with diluted chlorinated soda, and the ether applied thoroughly morning and evening. A change for the better soon came over the parts, and the patient recovered with the loss of a portion of the alveolar border of the jaw. Of course we combined with this treatment tonics and stimulants to the fullest extent.

The question here arises whether ether might not act beneficially locally applied to true gangrene?

In acute pharyngitis, the sore throat every day met with, we have found it one of the very best applications, in all its stages. We apply it with a camel's-hair brush; at first it stings for a minute or two, and then a pleasant coolness is experienced in the part, giving most marked relief, and patients almost invariably express themselves as feeling greatly benefited. The most noticeable feature in these cases is, the rapid subsidence of the swelling and tumefaction of the parts, and which the patients never fail to notice. In chronic pharyngitis also it produces the same marked relief; and in specific and non-specific ulcerations of the throat, where the patient is much troubled by the accumulations of mucus and the other secretions, we have found the best plan of treatment to consist in washing out the throat well with a mop dipped in a strong alkaline solution which dissipates the mucus, &c., and then applying ether to the parts. In chronic laryngitis we have seen benefit derived from inhaling ether, not of course up to the production of anæsthesia. Here an attempt at its local application proves decidedly irritating.

In diphtheria we have not yet had the opportunity of testing the remedy, but this is the disease in which we have always expected to derive the greatest benefit from it. While we do not consider the mere throat manifestations as the sum and substance of diphtheria, nevertheless it is rational to suppose that these exudations, when swallowed, must tend to poison the system anew, and set up exhausting diarrhœas, &c., and looking at them in this light, it is certainly of the greatest importance to get rid of them. It is also, perhaps, of not less importance to get rid of the mechanical impediment which they offer to the breathing, and also of the swelling, which is so often a serious matter. As before stated, we have not had the opportunity of testing it in this disease, but my friend, Dr. D. F. Woods, of this city, has kindly reported to me a case in which he used it, and in which he derived from it all the benefits before mentioned. He said it appeared to disperse the membrane, reduced the swelling, and altogether placed the patient in a more comfortable condition. Dr. Woods also reported to me that he had used it often in the ordinary pharyngitis, tonsillitis, &c., frequently combining nitrate of silver with it, and always with the most marked and decided benefit, surpassing in his estimation all other remedies.

It strikes me at the moment that ether might also be useful to cleanse the teeth, gums, and tongue from sordes, and such accumulations in low fevers, and might possibly produce a permanent change for the better in the secreting apparatus there situated.

There is another trouble in which ether must prove a very valuable remedy, although we have not had the opportunity of testing it. We refer to "herpes præputialis," that annoying and troublesome complaint with which some persons are so much afflicted. It would also possibly prove efficacious in many skin affections, such as eczema, psoriasis, &c., the crusts having first been removed with a poultice.

According to Professor Wood, ether has been locally applied to neuralgic pains, earache, superficial burns and scalds, and also to aid in the reduction of strangulated hernia; but in all these cases the cuticle was entire. There are doubtless many other conditions in which ether might be beneficially applied as a local agent, and which will doubtless suggest themselves in practice. There is, however, one more condition in which we must refer to its beneficial action, viz., chronic ulcers. We have not had the opportunity recently of observing it in those troublesome lesions, and here beg leave to express our thanks for the following observations made in the surgical wards of the Philadelphia Hospital, Blockley, by our friend Dr. Charles E. Smith, Jr., resident physician in that institution.

"At the suggestion of Dr. J. J. Black I tried the effects of ether as an application to chronic ulcers in the surgical wards of the Philadelphia Hospital, Blockley. For the first trial I selected ten cases, the ulcers being on the legs, and from one to twelve years' standing; some of them having been partially healed during that time, and had reopened. In seven of these ten cases the sores were covered with a dirty yellowish-white exudation, looking as though melted tallow had been poured over them; two were indolent in character with thickened and everted edges; one was in a sloughing condition. The seven first mentioned healed up rapidly in from two to four weeks, leaving a *very* small cicatrix. The indolent ones improved for a time under the use of the ether, but soon ceased to respond, other remedies seeming to finish what it began. The sloughing one remained as it was, the application seeming to have no effect. The patient died of scurvy. After this I tried it upon three more cases in which the tallow-like exudation was well marked, with the most satisfactory results, they having healed within three weeks. The ether was applied with a camel's-hair pencil, about one drachm painted on every morning like varnish, nothing else being done for them, except supporting the leg with a bandage. They improved from the first application, granulations of a healthy character sprung up almost immediately, and the ulcers healed rapidly, leaving a very slight cicatrix. In one case in particular in which the ulcers had existed for three years, the skin for several inches around them being of a dirty brown colour, healed as though by magic, and at the end of a month the colouration had almost entirely disappeared. These experiments have led me to the conclusion that in chronic ulcers, in which there is an exudation over the surface looking like a false membrane, the ether causes it to disappear and granulations to spring up, the ulcers healing much sooner than by any other means. In indolent ulcers with raised edges it acts very well for a time as a stimulant, but sooner commences to lose its power. I think the ether acts more decidedly during hot than during cold weather, the ulcers then appearing to respond to it with more certainty."

The ether used in all the foregoing cases was the sulphuric ether, the "Æther," U. S. P.

In regard to the manner in which ether locally applied produces its results, we remark, in the first place, that it is a local stimulus, and appears thoroughly searching and penetrating in its action. Thus then it increases absorption, prevents or dispels congestion, and allows free osmotic action. Again, very probably it changes the nature of the local cell action, which having been turned from its normal channel may thus be driven back to its course. Again, it undoubtedly acts to a great extent chemically. It has been shown by Rokitansky and others that most of these exudative inflammations contain fat, both the mucoid exudative and the fibrinous exudative, the one running into the other, except it be checked. Now the well-known solvent power of ether over fats shows us then that it must act beneficially through its chemical properties. Other chemical changes it doubtless brings about, but of their true nature we are at present unable to determine.

Such then are the results obtained from our short experience in the application of ether as a local remedy, that it is available for much more extended usefulness, we have little doubt; as such then we commend it to the profession, with the full assurance that it will prove a valuable accession to the armamentarium of the physician.

N. B.—It is well to bear in mind when using ether in any manner that great caution must always be observed to prevent the near approach of flame or heat to it, for by neglecting this point serious accidents may arise.

Art. V.—*On Chloroform and Ergot in Obstetric Practice.* By Charles C. Hildreth, M. D., of Zanesville, Ohio.

Very soon after the introduction of chloroform by Dr. Simpson, I commenced its use; and have formed the following opinions in regard to its value.

1st. That it is a very safe agent in obstetric cases. I have not seen the least approach to danger from its use during labour.

2d. When the case is properly selected, it not only saves the patient a vast deal of suffering, but very much shortens the duration of labour.

3d. By tranquillizing the nervous system, diminishing shock, and sustaining the vital energies, chloroform secures the patient a far better recovery after labour.

4th. I have found chloroform very valuable in all instrumental deliveries and operations; in puerperal convulsions, by whatever cause induced; and in all cases of version. But the chief value of chloroform is in tedious, lingering labour, arising from rigid, undilatable os uteri, and accompanied by too feeble or excessively painful contractions. In such a case, chloroform acts like a charm. Under its influence, the rigid os uteri becomes soft and pliant, the mucous follicles of the uterus and vagina pour out their secretions in abundance, and labour progresses rapidly. Obstetrical authorities advise us, in nearly all cases, to leave the membranes intact until the os uteri is fully dilated. With the patient under chloroform, I am confident this advice may in many cases be disregarded with perfect safety to both mother and child. It has been my practice in cases of lingering labour to administer chloroform, rupture the membranes, and discharge the waters freely. By this practice, we add very much to the energy and efficiency of the uterine contractions. An over-distended bladder is nearly paralyzed, and cannot contract, until part of its contents is removed by the catheter. So often we find the uterine muscular fibre so over-distended that its contractions are almost powerless. As the last pains of labour are usually the strongest, simply because part of the uterine contents are expelled; so the first pains are rendered more efficient, by diminishing the capacity of the organ. The patient under chloroform, and the waters discharged, if the os uteri does not dilate easily, I have found the occiput of the child, and the well lubricated fingers of the accoucheur carefully applied, as safe and much more efficient dilating instruments than the bag of waters.

That the danger to both mother and child, from early rupture of the membranes, is very much exaggerated, I have not a shadow of doubt. It is quite a common occurrence to find the waters break naturally, days, or even weeks, before active pains come on, and yet such labours generally do well. So also, in rupture of the membranes, at the seventh or eighth month, in cases of deformity, or exhaustion, or hemorrhage, we usually find such labours terminate successfully.

Dr. Blundel, in his excellent work on Midwifery, takes frequent occasion to remind his reader that "meddlesome midwifery is bad." So indeed it is, in natural labour, which progresses fairly and satisfactorily. So long as nature is doing well her work, it is no doubt bad practice to interfere; nor will any good accoucheur advise it. But if "meddlesome midwifery is bad" in perfectly natural labour, the "trust to nature" practice is much worse, in cases requiring obstetrical assistance. In looking over the statistics of lying-in hospitals, we are at once struck with the fearful rate of mortality to both mother and child, when the duration of labour exceeds by a certain number of hours the natural period. There is a point of endurance of suffering beyond which nature will succumb unless relieved.

In lingering labour from any cause, I am well convinced, the rate of mortality to both mother and child will be much diminished by the use of chloroform, the early rupture of membranes and discharge of waters, by the artificial dilatation of the os when required, and by the use of ergot or other uterine stimulant when pains are inefficient. Dr. Tyler Smith expresses my sentiments in saying, "I believe in the present day more mischief is caused from a kind of fear of the uterus, and of interfering with its natural action, than from bold and intelligent efforts to guide and control it."

Chloroform and ergot in obstetric practice are antagonistic powers. The one diminishes uterine contraction, the other increases it. Knowing this fact, we often give ergot in lingering labour with inefficient pains, much earlier than we would consider safe without the use of chloroform.

If ergot acts too energetically for the safety of the child, it is very easy to control such action by chloroform. If chloroform suspends uterine contraction almost entirely, it is readily aroused again by ergot. The skilful practitioner, by the judicious application of these two remedies, cannot fail to alleviate much suffering, as well as to diminish very much the duration of labour.

Having said so much in favour of chloroform, allow me to state one very serious objection to its use in obstetric practice. Chloroform most certainly predisposes our patients to post-partum hemorrhage. Theoretically, we would anticipate such a result; practically, we are assured of the fact. We have in ergot, fortunately, an almost certain preventive of such a catastrophe. When, therefore, chloroform is given in the latter stage of labour, the accoucheur has not done his whole duty to his patient, unless he also gives an efficient dose of ergot before the child is born or the placenta delivered.

Ergot, when given in labour without the use of chloroform, requires careful and skilful management. Most authors condemn the use of ergot in first labours. They tell us that it seriously endangers the life of the child, as well as the external soft parts of the mother. No doubt the authorities are right on this subject, and yet there are cases of first labours when ergot can be given with safety and benefit. By a careful regulation of the dose of ergot, we attain two very different results. A small dose repeated at intervals of fifteen to twenty minutes, will soon increase the frequency and energy of the uterine contractions, or bring them up to the natural standard. A large dose given at once, will often induce a continuous rigid spasm of the uterus, which in first labours without chloroform so often destroys the life of the child by interfering with the placental and fœtal circulation. In practice, I have found almost all the preparations of ergot efficient, but for convenience prefer the tincture. Of this preparation, I consider one-half drachm a minimum dose, when we merely wish to stimulate the uterus to increased efforts. As a maximum dose, two drachms never fail in my hands to induce contractions, sometimes so powerful as to require the use of chloroform to restrain them.

Thus, by a skilful regulation of the dose of ergot, and of the interval at which it is given, we may obtain almost any desired form and frequency of uterine action.

Although ergot is our most valuable and efficient remedy for feeble uterine action, yet we obtain decided results of a similar character, from borax and cimicifuga. From my experiments with borax, I have formed the opinion that it has no influence in originating uterine contraction, but if regular pains are present, they will be increased in force and frequency by half-drachm doses of the medicine once or twice repeated. The action of borax is much more mild than that of ergot. It does not induce the rigid continuous uterine spasm produced by a large dose of ergot, and hence can be given in first labours with much less danger to both child and mother.

I have found the cimicifuga also a mild but decided stimulant to the uterine muscles when once in action. Equal parts of tinct. ergot and tinct. cimicifuga make a very valuable and safe combination in practice. So also a solution of borax in decoction of cimicifuga will be found a fair substitute for ergot in certain cases. As a dilating remedy for rigid os uteri, I have found nothing equal to chloroform by inhalation. Belladonna locally applied, no doubt has a decided influence in relaxing rigidity; but is too uncertain, and perhaps too poisonous for general use. The lancet, and various nauseating remedies, have also had their advocates. One of my medical friends informs me that he relaxes rigid os uteri by administering by the stomach a drachm of chloroform in a glass of whiskey and water. From the few cases in which I have tested this practice, I have formed the opinion that the relaxing power of the remedy will be measured by the degree of intoxication produced.

In conclusion, allow me to state that a more general use of ergot in the last stage of labour will tend to prevent many of the diseases of the puerperal state. By the proper dose of ergot, we secure a firm contraction of the uterus. This prevents hemorrhage and violent after-pains from retained clot. The presence of coagula not only induces pain and tenderness, but also predisposes to metritis, peritonitis, phlegmasia dolens, and purulent absorption, or pyemia. These are some of the natural sequelæ of uncontracted uterus and post-partum hemorrhage, and they will be found to follow much the most frequently labours in which ergot has not been given. Practically, I am convinced of the fact that the mortality of the puerperal state would be much diminished, and the future health and comfort of our patients much improved, if it were the custom of physicians in every case of labour to give a full dose of ergot (if not before the birth of the child), invariably before the delivering of the placenta.

ART. VI.—*Remarks concerning some of the Diseases prevailing among the Freedpeople in the District of Columbia (Bureau Refugees, Freedmen, and Abandoned Lands).* By ROBERT REYBURN, M. D., Surgeon U. S. Vols.

THE appended Report, which gives the results of the treatment of seven thousand nine hundred and forty-nine (7949) cases of sick and wounded freedmen, who were under medical treatment in District of Columbia, Bureau of Refugees, Freedmen, and Abandoned Lands, from June 1, 1865, to December 31, 1865, has developed some interesting facts relative to the diseases prevalent among them, to which we desire to call the attention of the medical profession.

This report does not embrace *all* who were under treatment during the above months, but only those cases that were recorded and the results known.

This district Bureau of R. F. and A. L. embraces the city of Washington and the District of Columbia, properly so-called, the three counties of Alexandria, Fairfax, and Loudon, Va., and a part of St. Mary's Co., Md., together with a general supervision of freedmen's affairs in the whole State of Maryland. The total number of freedpeople who are more immediately under the charge of the Medical Department of this district, is, from a census taken by order of the Bureau, and which is now nearly completed, about fifty thousand; of these somewhat over fifty-two per cent. are full blood Africans, and the remaining forty-eight per cent. belong to the mixed races.

Out of the total number as above stated, three hundred and forty-six deaths are recorded, being about forty-three per thousand of those under treatment. This mortality is larger than exists at the present time in this district, and arises from the fact that the greater number of these cases were treated in hospital, and as only the more severe class of cases are sent to hospital, the mortality is larger than the average mortality of the cases treated in hospital and at their homes. Our mortality has been for the last three months about thirty-three per thousand of the number of cases under treatment, and is now diminishing rather than increasing in amount.

The first and most fatal class of cases (although not the most numerous) in the report is that of typhoid fever. The number of cases of this disease was one hundred and sixteen, and the number of deaths was forty-nine, or nearly forty-one per cent. of the number of cases treated. The post-mortem examinations made in the fatal cases presented the usual abdominal lesions characteristic of typhoid fever, and the only point of difference observable was that the pulmonary and cerebral inflammations which so frequently complicate this disease, and add to its dangers, were found to present a more asthenic type, and consequently were found to be more dangerous in their results than is commonly the case with typhoid fever occurring among whites. The pneumonia which we find so often in cases of typhoid fever occurring in the Caucasian race, in the negro becomes pleuro-pneumonia of a low grade, and is generally accompanied with a large amount of serous or sero-sanguineous fluid, which after death is found filling the cavities of the pleuræ. In fact, as a rule, inflammations of the serous membranes seem to be much more frequent and dangerous among negroes than whites, and it is rarely we have examined a negro cadaver which did not present evidences of recent serous inflammations in either the thorax, abdomen, or calvarium. The same condition above mentioned has been found by other observers, and we have been informed by Dr. Ira Russell (late Brevet Lieut.-Col. and Surgeon U. S. Vols.) that he has hardly ever opened a negro cadaver in which there was not a large amount of serous exudation. The observations of Dr. Russell on this point are deserving of especial weight on account of his having made the diseases and pathology of the negro race a speciality, and from his having assisted in making a large number of post-mortems of freedpeople while on duty in the west during the war. It may, however, be objected that in some of the above cases the effusion may have been post-mortem, but we feel convinced that such was not the case, for the following reasons, viz :—

1st. In many of these cases percussion revealed the existence of the effusion during life; and secondly, the amount of effusion was generally so great as to entirely preclude the idea of accounting for it by any mechanical transudation of the serum of the blood through the walls of the blood-vessels after death.

The next class of diseases worthy of notice is that comprising the various forms of remittent and intermittent fevers. The total number of cases belonging to this class was two thousand seven hundred and seventy-six, or about 35 per cent. of the total under treatment. This significant fact is, we believe, a sufficient answer to, and refutation of, the statement so often reiterated in our text-books that the negro race are not subject to and do not suffer from malarious diseases.

Now, it may be that in Africa, and in the West Indies, they do not suffer to the same extent as unacclimated whites do, but they certainly are not exempt from these diseases in this country; and as far as our own opinion goes, we are strongly inclined to the belief that this so-called exemption has no foundation in fact, and is unworthy of credence.

In order to show that the large number of cases of intermittent and remittent fevers occurring among the freedpeople of this district is not owing to the influence of temporary or local causes, we are permitted (through the courtesy of Surgeon C. W. Hornor, U. S. Vols., Chief Medical Officer of Bureau Refugees, Freedmen, and Abandoned Lands) to give a few extracts from the official reports received from other districts of this Bureau, which will, we think, confirm and strengthen our assertions.

The official monthly report for September, 1865, of the Surgeon-in-Chief of the District of South Carolina (Bureau R. F. and A. L.) for the cities of Charlestown, Beaufort, and Combahee Ferry, and St. Helena Island, is now before us, and from it we extract the following:—

> "The total number of sick freedpeople under treatment during the month was one thousand and ninety-six, and the number of cases of the above mentioned diseases was three hundred and ninety-seven, or about 40 per cent. of the total under treatment."

From a like official report for October, 1865, from the district of Virginia, Bureau R. F. & A. L. for the cities of Yorktown, Petersburg, Hampton, and Eastville, we find the following figures, viz:—

> "The total number of sick freedmen under treatment during the month was seven hundred and eighty-eight, and the number of cases of malarious diseases was four hundred and forty-one, or nearly fifty-six per cent. of the total number under treatment."

From a similar report for the month of October, 1865, from the district of Georgia (Bureau R. F. and A. L.), and for the cities of Macon, Savannah, and Augusta, we extract the following:—

> "The number of sick freedmen under treatment during the month was five hundred and eleven, and the number of cases of the above diseases was one hundred and sixty-seven, or nearly 33 per cent. of the total number under treatment."

We might continue to make extracts similar to the above to an indefinite extent, but we think it to be unnecessary, as all the reports we have seen, and we have consulted a large number, with especial reference to this point, give uniformly the same result.

The next and last class of diseases to which we will here advert is the tubercular; this includes consumption, what is usually denominated scrofula, and all the other varied forms in which the tubercular diathesis manifests itself.

The total number of cases belonging to this class was two hundred and ninety, or nearly four per cent. of the total number of cases treated. This result is somewhat striking, and is diametrically at variance with the extraordinary statements which have been made by some of our medical authors and teachers, and which are to the effect that scrofula (in some form) is almost universally prevalent among the negroes and mulattoes in northern latitudes.

Now, it is undoubtedly true that when the negroes and mixed races are exposed for a lengthened period to the combined evil influences of improper nourishment, insufficient clothing, impure air, and uncleanliness, that they are the victims of the various forms of scrofulous disease; but where well fed and clothed, and subjected to favourable hygienic influences, we are fully persuaded that such is not the case; and we believe that the statements above referred to are entirely mistaken and erroneous. As a proof of this we may cite the fact, that the same causes which produce and perpetuate scrofula among the coloured people, may be seen (to a limited extent) in operation among the poorer classes of white people in many of the larger cities of the Union, and produce among them precisely similar results; in other words, we believe that scrofula is nothing more than the effect produced upon the human system by unfavourable hygienic influences, and any of the races of men will suffer from it in exact proportion as they are subjected to these deleterious conditions.

In this District Bureau of R. F. and A. L. there are now three hospitals open, and eleven physicians employed by the Bureau, who attend them both at the hospitals and at their homes. The number of patients under treatment during each month has ranged from eighteen hundred to two thousand for some months past, and if scrofula occurred as frequently among them as has been represented, we think we would have had fair opportunities for observing it. There are many other points of interest connected with the diseases of the freedpeople, on which we might dwell, but the amount of space we have allotted to ourselves in this hasty sketch will not permit us to do so at this time.

Consolidated Report of Sick and Wounded Freedmen in the District of Columbia. Bureau of Refugees, Freedmen, and Abandoned Lands, from June to December, 1865 (*inclusive*).

Tabular list of diseases.	No. of cases.	No. of deaths.
CLASS I.—ZYMOTIC DISEASES.		
Order 1. MIASMATIC DISEASES.		
Typhoid fever	116	49
Typhus fever	4	2
Typho-malarial fever	19	4
Remittent fever	588	20
Quotidian intermittent fever	1096	1
Tertian intermittent fever	981	5
Quartan intermittent fever	74	5
Congestive intermittent fever	37	13
Acute diarrhœa	710	41
Chronic diarrhœa	378	33
Acute dysentery	139	5
Chronic dysentery	70	8
Erysipelas	44	1
Smallpox	54	
Varioloid	6	
Measles	165	5
Scarlet fever	9	1
Diphtheria	34	5
Mumps	31	
Epidemic catarrh	15	
Debility from miasmatic diseases	44	6
Other diseases of this order	4	
Order 2. ENTHETIC DISEASES.		
Syphilis	251	1
Gonorrhœa	77	
Orchitis (gonorrhœal)	14	
Purulent ophthalmia	11	
Order 3. DIETETIC DISEASES.		
Scurvy	20	
Delirium tremens	1	1
Other diseases of this order	5	
CLASS II.—CONSTITUTIONAL DISEASES.		
Order 1. DIATHETIC DISEASES.		
Gout	1	
Acute rheumatism	134	1
Chronic rheumatism	174	3
Cancer	12	
Tumours	3	
Dry gangrene	2	
Other diseases of this order	1	
Order 2. TUBERCULAR DISEASES.		
Consumption	139	36
Scrofula	148	4
Other diseases of this order	3	1
CLASS III.—PARASITIC DISEASES.		
Itch	66	
Intestinal worms	48	

Tabular list of diseases.	No. of cases.	No. of
CLASS IV.—LOCAL DISEASES.		
Order 1. DISEASES OF THE NERVOUS SYSTEM.		
Apoplexy (cerebral)	4	1
Epilepsy	19	1
Headache	103	
Insanity	10	
Inflammation of the brain	15	4
" " spinal cord	3	
Neuralgia	107	
Paralysis	23	6
Sunstroke	8	1
Tetanus	6	
Order 2. DISEASES OF THE EYE.		
Amaurosis	8	
Inflammation of the conjunctiva	61	
Inflammation of the iris	2	
Order 3. DISEASES OF THE EAR.		
Deafness	2	
Inflammation of the internal ear	2	
Otorrhœa	14	
Order 4. DISEASES OF ORGANS OF CIRCULATION.		
Aneurism—hypertrophy heart	1	1
Chronic valvular dis. of heart	10	4
Dropsy from heart disease	13	1
Dropsy of the pericardium	1	
Inflam'tion of the pericardium	1	1
Varicose veins	6	
Varicocele	3	
Order 5. DISEASES OF RESPIRATORY ORGANS.		
Asthma	19	
Acute bronchitis	167	3
Chronic bronchitis	43	1
Dropsy of the chest	2	
Epistaxis	10	
Inflammation of the larynx	8	2
Inflammation of the lungs	202	14
Inflammation of the pleura	130	2
Hemorrhage from the lungs	44	2
Other diseases of this order	33	2
Order 6. DISEASES OF DIGESTIVE ORGANS.		
Colic	69	
Constipation	101	8
Cholera morbus	21	
Cirrhosis of the liver	1	
Dropsy from hepatic disease	56	12
Dyspepsia	54	
Diseases of the spleen	3	

Tabular list of diseases.	No. of cases.	No. of deaths.
Order 6. DISEASES OF DIGESTIVE ORGANS.—Continued.		
Fistula in ano	6	
Femoral hernia	9	
Inguinal hernia	9	
Prolapsus ani	4	
Hemorrhage from the stomach	1	
Hemorrhage from the bowels	2	
Inflammation of the tonsils	60	
Inflammation of the stomach	3	
Inflammation of the bowels	7	2
Inflammation of the peritoneum	17	1
Acute inflammation of the liver	20	1
Chronic inflammat'n of the liver	20	
Jaundice	123	5
Piles	17	
Stomatitis	49	
Order 7. DISEASES OF URINARY AND GENITAL ORGANS.		
Calculus	13	1
Diabetes	10	1
Dropsy from renal disease	20	2
Diseases of the prostate	30	
Diseases of the testis	5	
Gravel	37	
Inflammation of the kidneys	8	
Inflammation of the bladder	30	
Incontinence of urine	12	
Hydrocele	10	
Other diseases of this order	10	
Order 8. DISEASES OF THE BONES AND JOINTS.		
Caries	1	
Inflammation of joints	2	
Order 9. DISEASES OF THE INTEGUMENTARY SYSTEM.		
Abscess	26	1
Boil	11	
Ulcers	52	2
Whitlow	7	2
Skin diseases	10	
UNCLASSIFIED.		
Malingering	5	
Old age	2	2
Pregnancy	13	1
CLASS V.—VIOLENT DISEASES AND DEATH.		
Order 1. WOUNDS, INJURIES, AND ACCIDENTS.		
Burns and scalds	13	
Contusions	42	1
Sprains	27	1
Dislocations	4	
Frostbite	4	
Simple fractures (not gunshot)	9	
Compound fracts. (not gunshot)	8	2
Gunshot wounds (of all kinds)	17	
Incised wounds	24	
Lacerated wounds	12	1
Punctured wounds	6	
Other accidents and injuries	9	2
Stillborn	1	1
Order 2. HOMICIDE.		
Order 3. SUICIDE.		
Order 4. EXECUTION OF SENTENCE.		
Hanging		
Shooting		
Total	7949	346

ART. VII.—*On Torpedo Wounds.* By S. W. GROSS, A. M., M. D., late Bvt. Lt.-Col., and Surgeon U. S. Vols.

SINCE the invention of gunpowder, the movements of an enemy upon a work have been materially impeded or weakened by the explosion of subterraneous mines; and although comparatively few cases of injuries from this cause have been reported, yet the mere knowledge of the existence of such devices must have a very demoralizing effect from mental trepidation upon an attacking party. Charges of powder, or several loaded shells contained in a box beneath the surface, constitute fougasses, which have been frequently resorted to; the object being to explode them by means of a fuse at the moment the enemy is passing over. At Sebastopol, the Russians employed double deal, water-tight boxes, of a capacity sufficient to contain thirty-five pounds of powder, exploded by means of sulphuric acid coming in contact with a mixture of chlorate of potassa, sulphur, and sugar. The acid was contained in a glass tube, covered by one of tin, and the weight of a person walking over it produced the explosion by crushing the glass tube, thus permitting the acid to come in contact with the combustible material.

So far as I have been able to learn, neither of the above contrivances was used in this country during the late war.

In the outer defences of Mobile, and especially about Spanish Fort, in April, 1865, the Confederates had planted an immense number of percussion shells, of from eight to fifteen inches in diameter, which were very harassing to our troops, so much so that it was even highly dangerous to take the horses to water. The loss of life and the number of injuries were large. The first instance of the employment of such measures during the war occurred after the evacuation of Yorktown, upon the occupation of which place many of our troops were killed and wounded.

My first and only experience with the torpedo was at Morris Island, South Carolina, in September, 1863, at which time Fort Wagner was in a state of siege. Early on the morning of the 7th of September it was determined to carry that stronghold by storm, the assaulting column being under the command of General Terry. It was, however, discovered that the Confederates had evacuated Forts Wagner and Gregg during the night, and made good their escape to Charleston. In front of the former work, a large number of torpedoes had been planted, and had the assault been made, the loss of life from this cause alone would have been very great.

All the torpedoes that I have ever seen were alike, being made of lager beer kegs, with cones of wood at each end, so that they resembled two cones with their bases in apposition. They were fifty-seven inches in length, by fifty-four inches in circumference at the middle. The keg portion was twenty-three inches long, covered with tar to prevent the powder becoming damp, and strongly bound with iron hoops. On the upper side was a heavy metal contrivance containing a percussion fuse, which consisted of a plunger and a percussion cap. The machine was buried, and a piece of board placed over the plunger, concealed by a light layer of earth and sand. It was said that four pounds' weight was sufficient to cause an explosion; and as a torpedo contained about sixty pounds of gunpowder, its effects can readily be imagined.

The lesions produced by the explosion of torpedoes are diversified. In a man whom I saw after being wounded at Yorktown, the entire posterior surface of the left leg and thigh was badly burned, the recovery being attended with contraction of the limb. Occasionally very grave and deeply seated injuries, without lesion of the integument, are produced, as in Case

III.; but more frequently complicated fractures result, or a portion of a limb is carried away. The following cases, all demanding amputation, illustrative of these injuries, came under my observation at the Field Hospital, Morris Island, S. C., and, strange to say, there was no example of instantaneous death. I ascribe the excellent results obtained to perfect quietude, fresh air, and a nutritious diet.

CASE I. *Torpedo wound of left foot; amputation of leg at lower third; recovery.*—Corporal W. H. Rich, Co. F, 4th Regt. N. H. Vols., was admitted at noon, Sept. 8th, with compound, comminuted fracture of the bones of the foot. The tarsal bones were extensively crushed, and the soft parts were in such a condition that no operation could be performed at the ankle-joint. The limb was removed at its lower third by the antero-posterior flap operation, and five ligatures were required. The case progressed most favourably. All the ligatures had come away on the 5th of October, and the patient was entirely well, with a good stump, on the 10th of November.

CASE II. *Torpedo wound of right leg; amputation at middle; recovery.*—George Wagner, private Co. D, "*Les Enfants Perdus,*" was admitted at 7 o'clock A. M., Sept. 9th, on account of compound comminuted fracture of both bones of right leg in their lower third. Above the point of fracture a large flap of integument on the calf of the leg had been made, and it was blackened by powder. My executive officer, Act. Asst. Surgeon W. H. Finn, U. S. A., removed the leg at its middle by the circular operation, six vessels requiring ligation. On the fifth day there was some sloughing of the integuments of the calf, with a discharge of offensive pus, but in a few days healthy granulations sprung up under the use of the creasote dressing. On the twenty-third day, the last ligature came away, and the man was sent north, well, on the 10th of October, with the stump nearly healed.

CASE III. *Torpedo wound of right leg: secondary amputation of the thigh at its lower third; ligation of the femoral vein; death from mortification.*—Sergeant Thomas Mack, Co. A, 4th Regt. N. H. Vols., was admitted at noon, September 9th. The right foot and lower third of the leg were swollen, livid, and cold; a fracture of the fibula, about four inches above the ankle-joint, and one of the tibia lower down, could be detected. The integument was unbroken, and he suffered severe pain.

At the expiration of sixty hours bullæ formed about the foot and ankle, when incisions were made in the foot and leg, followed by the escape of clotted blood, with the effect of diminishing the suffering. At the expiration of forty-eight additional hours, the limb had become warmer, and hopes were entertained of saving it; but during the night of September 13th, mortification set in, and at 3 o'clock P. M. the following day had extended three inches above the ankle. I then amputated by antero-posterior flaps at the lower third of the thigh. Eight ligatures were required, one including the femoral vein. The patient was much exhausted by the operation and by his previous suffering.

The tissues of the thigh were infiltrated with gelatinous-looking serum, and had a greenish-yellow aspect. An examination of the limb showed a comminuted fracture of the fibula, about four inches above the joint, and the same condition of the tibia just above the malleolus. The ankle-joint contained clotted blood, and blood was very extensively infiltrated among the muscles; but the orifices of the wounded vessels could not be discovered.

The patient did not rally from the operation, and death took place on the morning of September 16th. In the early part of the treatment the limb was swathed in cotton, full doses of morphia were administered to allay pain, and a nutritious diet and stimulants freely administered.

CASE IV. *Torpedo wound of right lower extremity; amputation above middle of thigh; ligation of femoral vein; recovery.*—Peter Riley, private Co. M, 3d R. I. Artillery, was admitted at one o'clock P. M., September 10th, with a very extensive torpedo wound of the right lower limb. The foot, with the exception of a small fragment of the calcaneum, had been blown away; the missile—supposed to be a part of the metallic exploding apparatus—had passed up the leg, leaving only the soleus and gastrocnemius muscles and the integument, and exposing the posterior tibial vessels and nerve. The entire anterior parts of the leg with the bones were carried away, a small portion of the head of the tibia alone remaining. The knee-joint was extensively fractured, and the internal semilunar cartilage had disappeared. The thigh-bone was fractured obliquely three inches above the knee, and bared to the extent of about six inches more, the periosteum being much bruised.

I removed the thigh by antero-posterior flaps at the upper part of the middle third, and applied six ligatures, one of which included the femoral vein, as this vessel continued to bleed and all other means had failed. On the third day the patient had slight traumatic delirium, and was transferred to Beaufort, S. C, on the 30th of September, where he came under the charge of Asst. Surgeon Ramsay, U. S. A. On the 9th of October the ligatures came away from the femoral artery and vein, and on the 10th of November the man had entirely recovered.

CASE V. *Torpedo wound of right leg; amputation of thigh at lower third; recovery.*—John R. Fordice, private Co. B, 39th Regt. Ill. Vols., was admitted September 12th, on account of comminuted fractures of both bones of the right leg, extending into the knee-joint, with great destruction of the soft parts. I removed the thigh in its lower third by antero-posterior flaps, seven vessels requiring ligation. The case progressed favourably without an untoward symptom, the ligature of the femoral artery coming away on the twenty-first day. At the expiration of the seventh week the cure was complete.

ART. VIII.—*Case of Neuralgic and Paralytic Affection following Precipitate Labour.* By ISAAC G. PORTER, M. D., New London, Conn.

CASES like the following, if we may rely on unrecorded testimony, are occasionally met with, and from their pathological obscurity and painful nature, demand a recognition in medical literature. That its probable cause may be better understood, it will be proper to mention a circumstance occurring in the previous labour.

In December, 1862, a lady, thirty-three years of age and mother of three children, was all day in labour with a fourth. At 11 P.M. (the os uteri being dilated to the size of an orange), the membranes ruptured, immediately after which the throes became continuously propulsive and violent, forcing the child rapidly forward until its progress was arrested, after the birth of the head, by the umbilical cord around its neck, which could neither be drawn downwards over the head, nor passed upwards over the shoulders. It was difficult to insert even a finger within the circle of the cord. The mother and child were nearly asphyxiated, and no resource offered except hastily dividing the cord with a pocket knife. It parted with an audible snap; the birth was immediately accomplished, the cord seized, and a ligature applied in the usual way. The posterior part of the child's neck was abraded transversely by the cord for nearly two inches, and the infant had a narrow escape from death by hemorrhage, it being necessary for a week to enforce gentle pressure on the part with pledgets of lint moistened with liquor persulph. ferri. The cord was relatively short, but not sufficiently so to have caused the delay. The mother's recovery was normal.

April 8, 1865. The same patient passed a tedious night, again in labour, and at 10 o'clock A.M. the os uteri was dilated to the size of an orange, when, rather to my gratification, the membranes ruptured—hoping that a consequent increase of uterine action might follow. The pains became gradually more powerful, until, as in the previous case, they were a perfect tornado—the birth being completed in fifteen or twenty minutes. Having the former case in mind, ether, which was by the bed-side, was administered as well as might be where the inhalations were so tumultuous. The child was larger than in the previous labour; its presentation, occipito-anterior-left. Very severe after-pains followed almost immediately, for which opium and camphor in full doses were given, but with little success; no sleep following for two days and nights.

10*th*. After-pains have given place to a constant numbness and burning pain in the hips, thighs, and back. These sensations were little, if at all, under the influence of powerful narcotics; twenty-five drops of Magendie's solut. morph. every third hour having but a trifling, if any effect. So painful was the sense of numbness or cramp, that the services of two women were required for hours consecutively to assuage her sufferings by vigorous friction of the parts affected. When the numbness subsided, hyperæsthesia of the same parts followed, the patient screaming with pain if touched at all roughly. A vigorous cathartic, with enemas, this day administered, moved the bowels thoroughly.

11*th*. Has had little or no sleep; is unable to pass urine. Catheter required for three successive days. Patient can lie only on her side; her limbs seeming paralyzed, and yet exceedingly sensitive. She can neither turn on her back or opposite side, nor suffer others to assist her in doing it. Milk and lochiæ normal; pulse 80 to 100; tongue somewhat coated; appetite poor.

14*th*. Much dysury, the effort to urinate causing great pelvic distress; decubitus lateral; is still taking morphia in full doses. A few large coagula escaped to-day, with some mitigation of distress.

15*th*. Motion at hips almost lost, the effort causing great pain. Pressure in the acetabulum, made by pressing upwards the head of the femur, increases the pain in the hips and back, as does every motion of the pelvis. Symphysis pubis not particularly sensitive. Vagina cool, yet there is increased tenderness when the finger impinges upon the sacro-iliac synchondroses, particularly the left. Involution of uterus normal. Perspiration over the hips and body is very profuse, so that her night-clothes are constantly drenched. This, continuing for weeks, formed an annoying complication. Dysury still continuing (urine acid and high coloured), it was treated with buchu, ext. hyoscyam. and camph., nit. potass. and mucilages, while constitutional symptoms were met with sulph. quin., aromat. sulph. acid in chamomile tea, opium and anæsthetic liniments. Their power and efficacy were not marked.

18th. Having lain four days immovable on one side, the nurses carefully raised her on a sheet and placed her on the opposite side, upon an adjoining bed, the change causing great distress. It being almost impossible to lift her by hand for any purpose, it is not strange that, through the combined influence of pressure, profuse perspiration and necessary discharges, bed-sores should form. Happily, through the unusual care of her attendants, they were never very large or severe. When the case became apparently chronic and inveterate, a water-bed and French urinal were procured, but she preferred trusting her faithful and skilful attendants. When the body is at rest, there is now but little acute pain, but micturition, or muscular motion of the parts affected, induces a return. It is less a scalding in micturition than an indefinable distress in the whole pelvic viscera. Purgatives have removed offensive fecal matters, but active cathartics were always subsequently attended with severe tormina, calomel especially. Empl. canthar., 4 by 6, applied to sacrum.

20th. Condition much the same; very little sleep. There being violent griping pains in the abdomen, continuing for hours, with tenderness, the nurse administered an ordinary enema and soon after another, when she was greatly alarmed at the discharge of what appeared to be *intestines* in portions of from one to ten inches in length, followed by much mucus, with extreme distress. It was a croupous or fibrinous membrane, some two or three feet in extent, and its discharge afforded great relief. A portion of ten inches was retained by the nurse for my inspection. It was tubular, of a light flesh colour, and thicker and more fleshy than a bladder. There was no return of this peculiar feature.

25th. Retention of urine; decubitus uni-lateral for four days continuously. Patient was again moved on a sheet; is always worse at night, and sleeps but little. Numbness in limbs demands constant friction. Appetite for solid food rather increasing.

27th. Power of motion decreasing while the effort causes more distress. It may be less a loss of power, than an unwillingness to be disturbed. Hyperæsthesia of surface nearly gone. Limbs colder than the body.

At this stage of the disease the patient was visited by Dr. Foster Swift, of New York. The case was again carefully examined in the light of modern physiology, hoping from the language of symptoms, the different kinds of sensibility as shown by pricking, tickling, and pinching, that might or might not exist, to deduce the true location and nature of the disease. The case was also submitted to high surgical and obstetrical authorities in New York, but without eliciting a decided opinion. It was also seen by Drs. Perkins and Hobron, of this city. Bromide of potass. in conjunction with carb. ammon. and tinct. cinch. comp. was prescribed as a soporific and nervine tonic, but its powers as an anodyne were doubtful or nugatory.

The urine was collected by means of sponges, and tested for albumen by means of heat and nit. acid, but without discovering more than a slight trace.

28th. Hip is abraded and an ulcer forming. As a preventive, the parts exposed have been frequently washed with alcohol, holding in solution a minute quantity of corros. sublimate. Dry cups to the spine are apparently of no benefit.

30th. Hypodermic injections of $\frac{1}{4}$ gr. sulph. morph. commenced, this morning, with the effect of quieting the pain and indefinable distress almost immediately, but without inducing sleep. In the following evening $\frac{1}{3}$ gr. morph. was injected.

May 1. Patient has had an entire night's rest, sleeping continuously two and a half hours.

It was found that a single injection daily of $\frac{1}{2}$ gr. at night quieted the pain and induced a delightful calm, the patient remaining wakeful. One-half a grain in the morning and one-third of a grain at night seemed necessary to quiet irritation and induce a fair amount of sleep.

4th. Patient decidedly better; moves limbs with less pain and more power, and during the night, by grasping the "head-board," partially turned on her back.

Still it was weeks before she could remain there, or sit up in bed. On the 18th inst., by means of the "head-board," she contrived to turn on her face. Ordered tinct. nux vomica and colomba in full doses three times a day. Constipation from the outset had been constant and obstinate, but from this date it ceased altogether. One grain of morphia is administered, hypodermically, daily.

22d. Had an attack of pain which was confined to the knee, with swelling and redness, but no unusual febrile action, and which yielded in three days apparently to a free use of alkalies.

28th. Had similar pains in the shoulders, symphysis pubis and muscles of the chest, which soon subsided under the same treatment and the influence of fair weather conjoined. Damp, cloudy weather and the electrical influence, whatever it may be, which attends thunder-storms, seemed now and subsequently to increase her discomfort. Morning dose of morph. this day omitted. Besides the nux vomica, she is taking iron, and whiskey and cream.

June 9. Sat in an easy-chair for the first time. Feels the loss of her morning injection, but her discomfort and weakness cease in five minutes after the administration of $\frac{1}{2}$ gr. morph.—the exemption from distress continuing six or eight hours.

11th. Turned from side to side in bed, and raised herself from her chair unaided, except as she pressed on its arms. Standing produces great discomfort at the hips.

July 1. Hypodermic injections have never produced the slightest inconvenience or drawback, except a slight condensation of cellular tissue in the neighbourhood of the puncture, which remained partially unabsorbed for a period of two months. In all cases the needle was introduced at or near the sacrum. Though always conferring strength and comfort, yet from this date they were discontinued, the cold salt bath taking their place. Her limbs and back were rubbed daily with alcohol and aqua ammon., particularly the left hip and leg, which has always suffered much more than the right.

13th. Walks the floor with only a cane; "burning" and stiffness remaining. Spine has never been tender on pressure.

Aug. 20. Her gait remains peculiar and "waddling." She is very stiff after sitting an hour, but motion is more free on exercise. Still much tenderness exists behind the great trochanter, and œdema of the legs and ankles, particularly the left.

Nov. 1. Faradization of the left hip and leg for a month has proved beneficial, though the gait remains unnatural. (The same is true also at this date, January 30, 1866.)

Before proceeding to consider the diagnosis and pathological relations of the main feature in the preceding case, it will be proper to advert for a moment to the unusual circumstance occurring in a former labour, and to which allusion has been made. Although cases are rarely met with in practice, or noticed in obstetrical works, where it is necessary to divide the cord before the entire completion of the birth, yet some features of this case, particularly the abrasion of the child's neck, seem to justify the course. Every accoucheur knows the importance of ascertaining, in the little interval usually occurring after the exit of the head, whether the cord surrounds the child's neck, since, should it be neglected, and the succeeding pain be very propulsive, no little trouble may supervene through inability to draw down the cord. Suppose a case, however, like the present, where the uterine nisus is continuous and powerful, the cord, which encircles the child's neck is so firmly pressed between the child and the soft parts of the mother, that the former is securely *tied* in its position, and must so remain until the cord breaks, or an intermission for a moment in the pains allows it to be drawn down. In a large pelvis possibly no difficulty would arise, the cord descending with the child. It is obvious, however, that unless the birth in such cases be completed soon after the division of the cord, the child may perish from hemorrhage, though the pressure to which it (the cord) is subjected will greatly diminish the risk. But perhaps a nearly equal danger arises from neglecting the operation, since traction and pressure combined must, by interrupting the circulation between the mother and child, prevent hæmatosis.

The question may arise: Is not this neuralgic and paralytic affection a case of puerperal paralysis, a disease so ably discussed by Churchill? His cases, however, were generally attended with uræmia, albumen being present in the urine, while in this case only a mere trace was discovered. It partook, moreover, less of paresis than of neuralgia. A remark of this author shadows forth, as it is believed, the true rationale of the affection. He says: "Paraplegia, as we have seen, has been attributed to severe and prolonged labour and to the mechanical pressure upon the nerves and muscles of the pelvis, and at first sight this seems an adequate and feasible explanation, and of which no one could deny the possibility." It is my belief that in the violent throes of labour the larger nerves of the pelvis, or the sciatic plexus whence they proceed, were injured, and "subinflammation and consequent thickening of the investing membrane or neurilemma followed." This conclusion seems authorized by the language of Dr. Hennen, quoted in the preceding sentence, who thus explains why obstinate traumatic neuralgia often follows bruises from gunshot wounds where the missile had only passed *near* a large nerve but without touching it; the inflammation in the neurilemma being sufficient in this case to produce abnormal nervous action, as evinced in numbness, burning pain, and semi-paralysis in the part, which ceased only as the original injury was repaired. Hypodermic injections, meanwhile, by their peculiar power in quieting irritation, subserved a most beneficent influence. To every accoucheur who has witnessed the painful cramps and numbness in the hips and lower extremities sometimes produced in the last stage of ordinary labour by certain positions assumed by the fœtus in its passage, it must seem passing strange that cases similar to the foregoing are so rarely encountered in practice.

The question may also arise: What connection, if any, was there between the croupous membrane discharged and the local nervous affection? Contrary to general experience, this morbid product of the intestinal mucous membrane, denominated by Good, diarrhœa tubularis, and by others fibrinous diarrhœa, was not in this instance chronic, there being no recurrence; nor was it found in a person of infirm health, as is almost universally the case. On the contrary it must have been the product, not primarily but secondarily, of the same cause as the other affections in question. In every case of these discharges that I have met with, there has been a marked lesion of the nervous system resulting in "chronic ill health," great irritability of the intestinal canal, rendering the administration of cathartics highly painful and injurious, while in some cases there have been regular alternations between the pain in the lower part of the abdomen and back, with occasional fibrinous discharges, and a most agonizing distress in the head, both affections never existing simultaneously. Dr. Mott, in a treatise written for the Sanitary Commission, assigns as a reason why operations under anæsthetics are less mortal, that "the nervous system controls the vascular. The nerves being protected, the pulse is but little affected and collapse is less marked." Thus in this case, the cause of lesion of the nervous system, whatever it was, may have produced a temporary influence on the vaso-motor nerves of the intestines, with the supposed morbid result. These exudations, as I have met with them, have usually been translucent, thin, and of a pearly white, and have gradually ceased to appear when with slight medication the person affected obeys the general laws of health. In the case before us, the cause being temporary, the effect ceased with it. As confirmatory of this view, a remark of Dr. Locock respecting the membrane in dysmenorrhœa may be quoted. "Although generally neuralgic, yet probably in those cases where the membrane is discharged, there may be an inflammation of the mucous membrane of a peculiar kind."

A single remark is added respecting the œdema in the left leg and ankle, which was peculiar, it being firm and persistent alike in the morning and at night, as if arising, not from debility or venous obstruction, but dependent rather upon a paresis of the vaso-motor nerves, and a consequent partial arrest of tissual metamorphosis.

Art. IX.—*On Fractures of the Larynx and Ruptures of the Trachea.* By Wm. Hunt, M. D., one of the Surgeons to the Pennsylvania Hospital. With a case.

P. M., aged 45, was admitted to the Pennsylvania Hospital, January 16, 1866. He was employed in a saw-mill, and whilst engaged in superintending a circular saw, which was driven by steam power, a piece of wood about two feet long and four inches wide flew from it, and struck him with great force on the front of the neck. He was not seen immediately by his fellow workmen, but was found by them it is supposed some fifteen minutes after the accident. He must have been knocked completely senseless, for, when found, consciousness had not fully returned. The symptoms on admission, at about one o'clock P. M., were as follows: Countenance pale and anxious, great dyspnœa, orthopnœa, respiration 30, pulse 90 and full, voice almost gone, could speak only in a hoarse whisper and with great effort, but repeatedly told me that he had no pain; could swallow water and soup slowly and without spasm. Had constant bloody expectoration. There was great emphysema of the sides, front, and root of the neck, so great indeed as to prevent the handling of the larynx, and thus interfering with positive diagnosis; but that this organ or some portion of the windpipe had sustained severe injury there was no doubt. Active surgical interference was not at once resorted to; but after the patient was placed in bed, anodynes were administered and inhalations of steam were prescribed. At 5 P. M., I saw the patient in consultation with Dr. Agnew. His condition was about the same, except that he could not swallow with as much ease as before, and although he made some contortions of the face in the effort, he declared positively that he had no pain. There was no increase in the emphysema. As the circulation was very good, it was still thought best not to operate, but to wait for more urgent symptoms. Gentle and even pressure was directed to be tried about the neck with compresses and roller in the hope of relieving the emphysema, but this could not be endured. Directions were left with the resident surgeon, Dr. Andrews, to send for me if urgent symptoms came on, and if there was not time for this, to open the trachea and insert a tube. In the night the patient grew worse, and about one o'clock A. M., as no time was to be lost, the trachea was opened by Dr. Andrews, and a tube was introduced.

Great ease followed the operation. The patient lay down and slept gently, but was evidently much exhausted, as his respiration was 40, and pulse 104. He did not rally from this condition, but gradually sank and died at a quarter past seven A. M.

Post-mortem.—The neck and thorax were particularly examined. The lungs were emphysematous throughout the upper lobes. There was great congestion of the posterior and lower portions, and this to such a marked degree in some places as to give the appearance of solidification, but all parts floated in water, and air bubbles could be pressed out from them. The anterior mediastinum was filled with air, and much was contained in its connective tissue communicating with that of the neck. There was an oblique comminuted fracture of the larynx, including both the thyroid and cricoid cartilages, and extending posteriorly on the right side through the base of the arytenoid, throwing this completely from its position and causing it to protrude through the lacerated mucous membrane of the same side. A slight laceration of the membrane of the opposite side was also found. Œdema of the glottis was well marked, and the aryteno-epiglottidean folds were enormously swollen with serum and extravasated blood.

Remarks.—This is the first case of fracture of the larynx that I have met with, and as the injury is spoken of by all authorities as being very rare, I have investigated its history and have been enabled to tabulate twenty-nine cases, twenty-seven of which are perfectly authentic, three or four involving the trachea only, but arising from the same causes and requiring the same treatment. There are many points of very great interest to notice, and I hope the list will have some influence in establishing a course of practice for what is really a very embarrassing case when one meets with it for the first time.

The prominent symptoms in nearly all cases are the same. There are dyspnœa, orthopnœa, and emphysema, with the consequent distress, anxiety, and lividity of surface. Pain and cough may or may not exist to any great degree, and as to deglutition, which is declared by some to be impossible, we have seen in this case that the patient could swallow without much effort.

I should regard *bloody expectoration*, in conjunction with the other symptoms, as almost diagnostic, and if the voice should be but a hoarse whisper, the larynx would almost surely be the seat of laceration. Of course, none of these signs are absolute, but the importance of them lies in the fact that the swelling is often so great as to render a manual examination of the larynx impossible.

When an examination with the fingers can be made the fragments will be detected and crepitus may be produced.

Some authors speak almost slightingly of this injury, and recommend rest, diet, and other palliatives. We will find, however, that it is a very grave casualty, for of the twenty-seven cases seventeen died.

Influence of Age.—Here we have a good instance of a statement being handed down through generations without investigation. Morgagni says he has seen this injury, and always in *advanced* age. He does not give his cases, but I have credited him with one of the unauthenticated ones in the list. We have the ages given in fifteen cases. All but one, a female of 66, were not over 45, and five instances occurred in children, one of whom was only 4 years old. From the occupations of the others when injured, it is to be presumed that most of them were not beyond middle life. It is not to be denied that ossification of the cartilages would predispose to fracture, but that this condition necessarily pertains to age, is not true. In evidence of this, I may quote the following observation in the transactions of the Pathological Society of London, reported in the *Medical Times and Gazette* for March 30, 1861:—

"Mr. Canton brought forward a larynx from a man aged 103, to show that certain changes, as calcification of cartilages, &c., were not merely the changes of old age, but indicated a general condition, which might occur in early age, and which was associated with definite changes in other tissues. The laryngeal cartilages in this specimen were very little ossified."

Causes.—Falls against hard and projecting substances, blows, kicks, and pressure are the common causes. All the children, except one, received their injuries by falls. One would have thought that the regular prize fighters would have furnished an example, but the only case of this kind is Marjolin's, and was caused by two women getting into a difficulty. M. Nélaton says, in his remarks on case No. 12, that "in Paris when quarrels occur they have a practice of introducing the hand into the cravat, and of twisting it so as to exert great pressure upon the neck. He had seen fractures of the cartilages of the larynx and of the thyroid bone, caused in this way, and he believed that such violence had produced a fracture of the thyroid cartilage in this case. It should be remarked that such fractures are often incomplete." There is a tendency in such cases to local inflammations, abscess, and denudations of cartilage.

Treatment.—Of the twenty-seven cases ten recovered and seventeen died. Eight were operated upon, but of these two died, leaving six recoveries by operation. Four cases got well by bleeding, rest, silence, &c.; but these were separations in the median line, and I infer did not lacerate the mucous membrane, as emphysema and bloody expectoration are not mentioned in any of them. In fact Gibb, who reports one of them, says that the patient complained of loss of voice and an indescribable sensation in the throat, and that there was neither difficulty of breathing, nor displacement except when made by the examiner.

Another case was in Marjolin's belligerent, whose thyroid was broken from the upper to the lower margin. The third was Dr. Norris's, and nothing of the kind could have existed in M. Nélaton's case, which was not seen until twenty months after the accident. But these cases are very rare. I think our list shows that active and prompt treatment by *laryngotomy* or *tracheotomy* gives the only hope of success where the emphysema and bloody expectoration show that the mucous membrane has been lacerated by the broken fragments. Between the cases that got well without operation and the others, we have all the differences that exist between simple and compound fractures in general, with the infinitely great addition that the function of the part is essential to life, and some part below it must supply its place before it can be put at rest.

Tracheotomy and laryngotomy are not new in these cases, as is shown by the successful operation of Habicot, in 1620, and also those by Liston, Eichmann, Sawyer, and Long; although Dr. Hamilton says, in his well-known work on Fractures and Luxations, "I am not aware that it has ever been practised except by myself, yet its propriety under certain conditions is sufficiently manifest."

If then, after getting the history of a case, we have bloody expectoration and emphysema accompanying the other symptoms, an operation should at once be performed, *for we have obtained no record of such a case getting well without it.* Although severe cases are rapidly fatal if let alone, yet considerable delay appears to be compatible with recovery, for in Dr. McLean's case the operation was not performed until the sixth day; but it is reasonable to suppose that if the case is a clear one no time should be lost, as the general exhaustion and actual damage to the lungs, by the agonizing efforts of the patient to get breath, must, if continued, materially interfere with a favourable result. The capacity of the larynx, through its delicate muscular structures, to rapidly accommodate itself to the altered condition of affairs, is beautifully illustrated in the cases that were successfully operated upon, for from all, except Dr. Sawyer's patient, the tube was removed much earlier than the injured parts could have been entirely healed. Chelius speaks of cutting open the larynx freely in the mesian line in its whole length and replacing the broken cartilages. It seems to me that this would be unnecessary in ordinary cases, and that in severe ones, where there is much comminution, it would be impossible. Eichmann elevated a dislocated portion of thyroid cartilage, in his successful case. He used a bent polypus forceps for the purpose.

Dr. Hamilton remarks: "If this operation were to be practised, the wound ought to be left open for a sufficient length of time to allow of the subsidence of the inflammation, and then permitted to close with such precautions as experience teaches are usually necessary after the windpipe has been opened."

Dr. Sawyer's case is worthy of especial notice, and illustrates the value of tracheotomy even where other very serious injuries complicate those inflicted on the windpipe. As soon as a requisite supply of air was furnished by artificial means, the patient slowly recovered from a condition that was about as hopeless as could well be imagined.

The laryngeal structures in this case were so displaced that six months after the original injury, Dr. Sawyer made the attempt to replace them, somewhat after the manner advised by Chelius, and to insert a tube in this position, with the hope of ultimately dilating and restoring the natural air-passage. His efforts, after great perseverance, were not successful, and the patient continued to wear the tube in the tracheal opening.

Statistical Table of Twenty-nine Cases of Fracture of the Larynx and Rupture of the Trachea.

No.	Author.	Date.	Sex & age.	Cause and nature of fracture.	Treatment.	Result.	Reference.
1	Habicot	1620	F. 25	A ball struck larynx, "damaging left side of thyroid cartilage."	A leaden tube was introduced in trachea, and allowed to remain 3 weeks	Recovered	"Surgical Inquiry, etc., by Nicolas Habicot," quoted in Louis on Bronchotomy, Sydenham Society, 1848, p. 229.
2	O'Brien	1818	F.	"Kicked under jaw;" thyroid and cricoid and first ring of trachea broken	Scarifications and opiates	Died	Ed. Med. & Surg. Journ., vol. viii.
3	Liston	1823	F. 8	Fell and struck larynx against a stone	Tracheotomy; tube kept in 8 days	Recovered	Ed. Med. Journ. Oct. 1823, vol. xix. p. 570.
4	Ollivier	1823	..	Particulars not given	......	"Died of suffocation"	Archive Générales de Médecine, tome ii. p. 307.
5	G. W. Norris reported by H. H. Smith	1837	M. 45	Knocked down by a blow, and struck neck on piece of coal; thyroid plates movable and crepitant; *no bloody expectoration or emphysema*	Bleeding, leeching, low and fluid diet	Recovered	Philad'a Med. Examiner, vol. i., 1838, p. 151.
6	Ladoz	1838	M. 37	Assassinated by strangling with a handkerchief; oblique fracture of right wing of thyroid	......	Died	Gaz. Mèdicale, 1838, p. 698.
7	Gibb	1845	M. 30	Fell against carriage step, and fractured thyroid in mesial line; *no bloody expectoration or emphysema*	Rest; no conversation allowed; fluid diet	Recovered	Gibb on Diseases of Throat, Œsophagus, and Windpipe, London, 1860.
8	P. Hewett	..	M. adult	Fell from scaffold; had other injuries, but the cricoid of the larynx alone was broken	......	Died	Transactions of Path. Soc., Lond., vol. i. p. 199.
9	Eichmann	1850	Child	Fell, fract. thyroid and separated arytenoid as in my case	Operation proposed and refused	Died	Brit. & For. Med. Chir. Review, 1851, vol. viii., p. 273, from Med. Zeit.
10	Eichmann	1850	F. 9	Fell on edge of iron chest	Laryngotomy	Recovered	" "
11	Marjolin	..	F. adult	Squeeze by another woman; thyroid broken from upper to lower margin; *no bloody expectoration or emphysema*	Silence, regimen, and a small bleeding	Recovered	Marjolin, Cours de Pathologie, p. 396.
12	Nelaton by W. F. Atlee	1852	M. 30	From violent twist of cravat by another person; seen 20 months after injury; diagnosis incomplete fracture of thyroid	Had abscess of neck over thyroid; was opened, and iodine injections used	Improved	W. F. Atlee's Notes from Clinical Lectures on Surgery by M. Nelaton, p. 122. Phila. 1855.
13	J. L. Atlee, jr.	J'ly 1856	M. 4	Fell against scraper; reported as rupture of trachea, but no post-mortem allowed	......	Died	Am. Journ. Med. Sciences, Jan 1858, p. 120.
14	Robertson	Sep. 1856	M. adult	Kick of horse; rupture of rings of trachea from larynx; latter uninjured	Bled	Died	Lancet, Sept. 6, 1856.
15	Hamilton	Nov 1856	M. 41	Kick of horse; thyroid and cricoid both broken	Cold and warm lotions, ice in mouth; laryngotomy on 2d day	Died	Hamilton on Fractures and Dislocations, 2d edition, 1863, p. 135.
16	McLean	1865	M. 32	Fell and struck neck against a stump; thyroid certainly fractured	Tracheotomy on 6th day; tube withdrawn on 9th day after operation	Recovered	Am Journ. Med. Sciences, Jan. 1866, p. 261, from Canada Med Journ., Sept. 1865.
17	Hunt	1866	M. 45	Piece of wood flying from circular saw fractured thyroid, cricoid, and arytenoid	Opiates and gentle pressure; tracheotomy 2d day	Died	Am. Journ Med. Sci., April, 1866, p. 378.
18	Plenck	..	..	Fell against rim of pail; thyroid and cricoid both broken	......	Died immediately	Malgaigne, Traite des Fractures et des Luxations, Paris ed., p. 409.

No.	Author.	Date.	Sex & age.	Cause and nature of fracture.	Treatment.	Result.	Reference.
19	Remer	..	..	Hanging	......	Died	Annales d'Hygiène, tome iv. p.171.
20	Long	1855	M. 20	Caught by neck between two railway buffers; trachea ruptured, and rings separated to width of one inch	Tracheotomy, & after tube inserted respirat'n entirely failed, and suction by the mouth of surgeon was resorted to to free the lungs from mucus and blood, and the lungs were also reinflated.	Recovered	Med. Times and Gazette, May 10, 1856.
21	Berger	1856	M. adult	Kick of horse under the jaw; trachea was torn from larynx, and this remained unbroken	......	Died	Berlin Med.Zeit., No. 33, from Med. Times & Gaz., Dec. 27, 1856, p 650.
22	Helwig	1861	F. 66	Cause never known; found dead in bed. Left side of thyroid broken, and both cornu of hyoid bone	......	Died	Casper's Vierteljahrschrift, 1861, No. 2.
23	Valsalva	..	..	Each has seen one case of fracture of cricoid alone. These must have died, as the statement would not have been verified. Histories not given.	......	Died	Malgaigne, Fractures and Luxations, Paris ed., p. 408.
24	Casauvieilh	..	..		......	Died	
25	Weiss	..	..	Also cricoid alone fractured, but in this case broken into fragments	......	Died	" "
26	Morgagni	..	..	Says he has seen fractures of larynx, and that it always occurs in advanced age	......	..	
27	Sodoly (?)	..	..	Cannot find the history. Mentioned in report of Dr. McLean's case	......	..	
28	Kenderdine	1855	M. 16	Kick of horse; fracture of thyroid and rupture of trachea	Palliative	Died	Unpublished case at Episcopal Hospital, Philada.
29	Sawyer	1854	M. adult	Fell 45 feet; hyoid bone, thyroid cartilage, jaw, radius, and patella broken.	Tracheotomy on 6th day; had ceased to breath when trachea was opened. A quill was inserted, through which lungs were inflated; tube continued to be worn a year after operation.	Recovered	Am Journ. Med. Sciences, Jan.1856, Art. I.

NOTE.—An Essay on Fractures of Cartilages of Larynx was written by Cavasse, Paris, 1860. I have not had access to it. I also have read that during the recent war against the rebellion, tracheotomy or laryngotomy was resorted to fifteen times, with six recoveries.

The details of these cases have not been published, but doubtless some of them were for injuries to the main air-passages. It is not intended to include gunshot wounds of the larynx in this paper, but some of them require to be treated on the same principles as internal fracture and rupture. Habicot's case was one of this kind, and in Guthrie's Commentaries, &c., Philadelphia, 1862, p. 573, a case is reported of a soldier whose thyroid cartilage was shattered by a ball. Tracheotomy was performed on the second day, but the patient died shortly after the operation.

Art. X.—*Report of Eight Cases of Lithotomy performed during the past four years.* By Paul F. Eve, M. D., Prof. of Surgery in the University of Nashville. Read before the Nashville Medical Society, January 3, 1866.

During my connection with the Southern army eight cases were operated on for urinary calculi, in the States of Mississippi, Alabama, Georgia, and South Carolina. In four of these a plurality of stones was found. From one 18 were removed; 17 from another; and from the two others 2 each—making an aggregate of 43 calculi in the eight cases. Moreover, in the case presenting the greatest number, this was the third operation that had been performed on the same patient, 193 calculi having been taken from him at the three operations. Of the eight cases three proved fatal; but one of these, however, it is believed could be properly attributed to the operation.

Case I. *Patient 60 years old; lateral operation; death sixty-four hours after operation.*—While stationed in Columbus, Miss., I operated on Mr. N., of Hinds County, in that State, who for years had been affected with symptoms of stone. He had consulted Dr. Warren Stone, in New Orleans, who told him he had several calculi, which was verified by the operation. My patient was a short, thick-set, fat man, aged 60. His suffering had been so protracted, and lately so acute, that he had determined on an operation, even if it cost him his life. The prostate gland was found so enlarged, and the perineum so deep, that the bladder was never reached with the finger, either by the rectum or the incision, and the female catheter, five and a quarter inches in length, had to be buried in the wound to reach the urine.

Having no lithotomy instruments with me, my friend Dr. Samuel Malone, formerly a surgeon in the U. S. Navy, kindly loaned me his case, and urged me to use the gorget. He had himself cut some twelve or fifteen cases, as well as I recollect, with uniform success. His grooved staff was of the old pattern, representing the segment of a large circle, and was therefore of unusual length. I had operated for hæmorrhoids on the doctor about this time, and was therefore deprived of his valuable assistance.

This operation, performed on the 26th day of May, 1862, was the lateral, with the gorget; my first, and I hope it will be my last, with that instrument. I felt unwilling to trust, as I had done before, to the knife alone, in so deep a perineum. I have little doubt that the beak of the staff, in pushing the gorget into the bladder, injured the organ, and may have produced the acute cystitis of which he died. It may have been previously inflamed by the foreign bodies it contained, and was therefore only aggravated by the operation. The composition of the stones, *phosphate of lime*, would tend to confirm this latter opinion, as stones of that composition are almost exclusively due to diseased bladder. The patient, being in a state of anæsthesia, could not of course be sensible of any damage done him during the operation; but from the time he became sensible to pain till his death, which occurred sixty-four hours after, he complained of a constant pain over a point a little to the right of the median line of the pubic region. A *post-mortem* revealed no peritonitis, but a dark inflamed spot on the internal upper surface of the bladder. This organ, thickened, inflamed, softened, and rugous; the prostate gland greatly enlarged, two inches in diameter; just behind this gland lay nine small calculi, which, added to the eight larger extracted during the operation, make the number seventeen. They have a pretty uniform, tetrahedral shape, except the largest two and the smallest, which are globular, with only two flat faces; are of a fawn colour, with polished surfaces, and weigh five drachms.

Acknowledging the many advantages of the lateral operation, and having occasionally selected it myself, I certainly have no desire to disparage that method, nor to denounce the gorget, since excellent results have followed its use; still I cannot but think that the sad issue in the above case might have been different had the more direct operation into the bladder, with the bilateral section of the prostate, been performed.

Case II. *A conscript, aged* 20; *bilateral operation; recovery.*—W. M., of Carroll Co., Georgia, was conscripted, and sent to the Gate City Hospital in Atlanta, to be treated and prepared, if possible, for the service. He had had from infancy symptoms of stone, and would have in all probability died if his vesical distress had not been relieved by operation. After due preparation the bilateral operation was performed on him the 18th October, 1862. Within three weeks he was well enough to be furloughed, and on his return he was regularly detailed as a nurse in my hospital. His constitutional stamina was very much impaired, and it is doubtful whether he will ever become a hale and healthy man, though he was fully relieved by the operation. He did full work of a nurse. The calculus measured six and a quarter inches in the greater circumference, by five inches in the shorter, and weighed nearly four ounces.

Case III. *Boy* 12 *years old; bilateral operation; recovery.*—This was the son of a soldier, family connection of the above, and operated on the same day and by the same method. A remarkably irregular calcareous mass was removed from his bladder, weighing several drachms, and broken into nine fragments. Its shape is concavo-convex, with undefined edges, fitting the bladder apparently just within the neck, and is about half an inch in thickness. Its composition is the ammoniaco-magnesian phosphate, or fusible calculus.

The patient, about twelve years old, returned home in a few days; his wound healed; but I don't suppose he will long remain free from calculous affection, for there are apprehensions of incrustations in his bladder.

Case IV. *Patient* 56 *years old; third operation; bilateral;* 18 *calculi; death from erysipelas, but not traumatic.*—This is a case of no uncommon interest; independent of the number of stones generated in it, the source of the lithiasis is clearly defined; we know the cause of their formation.

In September, 1824, a terrific equinoxial gale swept the Southern Atlantic coast. Sea birds were driven by it far into the interior of Georgia, and the beautiful China trees, the pride of India, were prostrated in the streets of Augusta. By this hurricane our patient, Mr. O'B., then at work on a house in Hamburg, was injured by the falling building, a stick of timber striking him in the lumbar region. From this he dates all his vesical distress. He was then eighteen years old. For twenty-four years he searched the land and sea (for he even became a sailor) for relief, but all in vain; until in January, 1849, I performed the first operation on him in the hospital of Augusta. At this time he urinated by pushing up the bladder with the fingers in the rectum, while he was in the horizontal position. He stated, too, that a large quantity of muco-purulent matter escaped with the water from the bladder, which was highly ammoniacal. By an incision into the perineum 56 calculi were removed, and then with the double lithotome conducted by a grooved director, and bilateral section of the prostate 61 more extracted from the bladder. The patient was so emaciated at this time that like a child I took him in the arms up a flight of stairs after the operation.

These calculi were impacted in the perineum and cystic cavity; have a uniform shape, tetrahedral, with rounded angles; are highly polished on their surfaces, and vary in weight from a few grains to two drachms. Chemically they consist of almost pure phosphate of lime. The membranous portion of the urethra preserved its integrity, while the bulbous became distended and retained the stones as they attempted to pass out from the bladder.

This patient made rapid recovery under the circumstances, having returned home the eighteenth day after the operation.

In 1854, five years after this, Mr. O'B. wrote me that he had a return of his former symptoms, and being unable to come to Nashville, my kinsman, Dr. H. F. Campbell, then of the Medical College of Georgia, now in the New Orleans School of Medicine, operated on him some time about 1857, extracting successfully 58 calculi.

In April, 1863, the third operation was performed on this patient in Atlanta, unfortunately in an hospital, and 18 stones removed—making a total of 193. He did remarkably well up to the tenth day, when he complained of being very sick, and became quite feverish. As the wound of the bilateral operation was in good condition, he was encouraged with the hope of a speedy return home. On the twelfth day, greatly to our surprise and deep regret, the left forearm, near the wrist, was attacked with erysipelas, which, in his feeble state of health, made such rapid progress in spite of the means employed, that life was soon extinguished. The wound even then presented nothing unusual. It is right to state there was no case of erysipelas near the patient at the time of the operation.

These calculi, presenting as they do the same appearance, shape, colour (nearly white), composition, &c., must have had a common origin. They were certainly formed and moulded in the bladder; were evidently *cystic*, and not nephritic. Dr. Means, now of the Atlanta Medical College, who analyzed them, supposed at the time that the prostate gland had some agency in their production. The patient, however, declared that his virile powers were still unimpaired, and his wife was actually seven months pregnant when he underwent the first operation. The true explanation of their multiple formation, it seems to me, is that the injury to the back of the patient caused partial paralysis of the bladder. Chronic cystitis then ensued from long sojourn of the urine in this receptacle, leading to decomposition of its secretions and the deposit of the earthy phosphates, while mechanical and chemical action account for their peculiar organization. Authors agree with much unanimity in the great disposition to phosphatic concretions following blows to the dorso-lumbar region. It is curious to observe too how closely in every particular (except a slight shade in colour) these calculi resemble those removed from Mr. N., or in the first case here reported; they also being in all probability due to chronic inflammation of the bladder.

Case V. *Female aged* 40; 2 *calculi; relieved by the vaginal section.*—Mrs. D., mother of several children, residing in Jefferson County, Georgia, has experienced during the past four or five years great distress in urinating. On the 17th of June, 1863, I found on examination a portion of a calculus projecting into the vagina about an inch and a half beyond the orifice of the urethra. As there thus existed a vesico-vaginal fistula, on the grooved probe passed through the urethra and out of the fistulous opening into the vagina, an incision was made through which two pretty large calculi were extracted from the bladder. One rotates in the other like a ball and socket, having finely polished surfaces, while everywhere else they are both quite rough. They measure six and a half by four and three-eighth inches in their circumferences. The smaller one was situated anterior, while the larger occupied the fundus of the bladder, and it was a tubercle from this one which had ulcerated the vesico-vaginal septum.

I have heard two or three times from Mrs. D. since the operation, that she is satisfied with the result. Without knowing her actual condition, I would suppose she has still *stillicidium urinæ.*

Case VI. *Boy* 7 *years old; bilateral; recovery.*—This was the son of the Rev. Mr. McQ , of Talladega, Alabama, whom I cut bilaterally the 7th of November, 1863, and who was effectually relieved. He was at the favourable age for lithotomy. The calculus extracted resembled an almond.

Case VII. *Boy* 3 *years old; bilateral; recovery.*—The son of the purveyor of my hospital, Capt. W., residing near La Grange, Georgia, was operated upon the 2d of December, 1863, by the same method and with as good result as in the above case. The stone removed was about the size and shape of a common marble.

Case VIII. *Patient* 24 *years old; bilateral;* 2 *calculi; death from imprudence.*—Mr. A. W., aged 24, of Barnwell District, South Carolina, has suffered many years from difficulty in urinating, and could now only effect this pressing necessity while in the recumbent position, and with one leg elevated during this act. He was so feeble and emaciated that even conscription left him unmolested.

On the 21st October, 1864, by the bilateral operation I removed two stones, which weighed together about twenty drachms. They have not been returned to me by the family.

With care and prudence my patient was gradually improving, doing well to the twelfth day, when he unfortunately ventured to get out of bed, and standing near the fire became faint, and before caught fell on the hearth. He never fully reacted, but sank on the fourteenth day, two weeks after the operation.

Nashville, Tenn., Jan. 6, 1866.

Art. XI.—*On the Use of the Hypersulphite of Soda in Intermittent Fever.* By Thaddeus L. Leavit, M. D., of Germantown, Pa.

Intermittent fever and its analogous affections result, as is generally believed, from a contamination of the blood caused by the introduction into it of organic poisons, generated by heat and the decomposition of vegetable matter, constituting the marsh miasma of writers. These vegetable germs or sporules, floating in the atmosphere of malarial regions, each one in itself a living organic power, on entering the circulation act as a ferment, and the oft-recorded results follow—the disturbance of the nerve centres, the blood thrown upon the internal organs, the chill, the reaction, Nature's mighty effort to establish an equilibrium in which she overshoots the mark and fever follows; then the pouring out of the watery constituents of the blood in the sweat, the debility, &c. &c. This theory of the fermentation of the blood, though not by any means a new idea, is not universally believed, though indirectly proved by the success of remedies exhibited.

Dr. Samuel Jackson, of this city, taught this doctrine in his late lectures at the University of Pennsylvania, and enthusiastically believed in the correctness of the theory of this ferment existing, as the materies morbi, in the blood of the intermittent fever patient, and that any remedy that arrested and neutralized this action wrought a cure, hence the efficiency of cinchona and its preparations. The powerful property of the sulphite of soda as an antiferment is a domestic fact well known to the farmer, who, by its addition, preserves his cider sweet for months.

Acting upon these principles this new remedy was administered with the following results:—

Miss M——, æt. 19, who resides in a malarious district, was attacked with remittent fever, and continued for a few days without any medical advice, feeling miserable and unfitted for any duty. Finally the chill set in fairly, morning, noon, and night, with scarcely a cessation of a few minutes between the stages. Sulphate of quinia was administered immediately in varying doses, and its constant use continued until at the end of four weeks the stomach became intolerant and not the slightest influence on the regular routine of chill, fever, and sweat was perceptible; the patient also suffered from excessive nervousness, which, of course, somewhat complicated her case. Quinia was again, after two days' suspension, renewed, but with no remediable effect.

October 12. This afternoon I began with fifteen grain doses every three hours of the hyposulphite of soda in solution with a little orange flower water, which formed quite a pleasant preparation, to be continued through the night. At my visit the next morning at eleven o'clock, the pulse was eighty-four beats in a minute, and no chill had been felt, the first omission in the exacerbation for over four weeks.

The sulphite was continued for three days, and then at longer intervals, and effected a perfect cure.

In those cases which resist the beneficial influences of quinia, the hyposulphite will prove of great value, while its rapid absorption and speedy action render it in congestive and malignant types, where relief must be furnished immediately, a prompt and efficient remedy. The principle of its action holds good in all diseases of blood poisoning and of zymotic origin; hence the success of Polli of Milan, Cummins of Cork, and others. The gradual decay of the cinchona tree and the increasing scarcity of its preparations warn us to seek in time a substitute for this most valuable drug. I firmly believe we have found it in the hyposulphites.

Art. XII.—*On the Treatment of Certain Chronic and Acute Affections of the Skin by means of the Chloride of Iron.* By Bedford Brown, M. D., of Washington City, D. C.

I desire to call the attention of the profession to the value of the chloride of iron, as a remedial agent in the treatment of certain acute and chronic affections of the skin. The applicability of any single remedy to affections of such varied origin, character, and progress, and yet involving an individual organ, as the skin, obviously implies a great diversity of medicinal property. But few remedies will be found to possess this diversity of property in a higher degree than the chloride of iron. Combining active tonic and alterative virtues, with a very remarkable power for the control of certain local inflammations, probably due to very active astringent or hæmostatic properties, the adaptation of this article to the treatment of the protean affections of the skin, would at once suggest itself. A very considerable experience with its use in the treatment of cutaneous affections, has satisfied me that but few remedies, if any, possess in a higher degree such decided virtues, or a more extensive range of application in the treatment of this class of diseases, than the chloride of iron. It is equally applicable to the acute or chronic forms. The skin being an organ remarkable for its abundant supply of vessels, *vascular dilatation* plays an important part in the history of its diseases; in the more chronic forms acting as an element for the perpetuation of morbid action, while in the acute it becomes greatly accessory to its superficial extension or diffusion. To what extent the morbid processes of eruption and engorgement are dependent on each other, or perpetuated by this pathological state of vascular dilatation in chronic affections is a question of considerable interest.

Doubtless the extreme liability of the skin to morbid affections is due to a very high degree of vascular organization. It comprises a great capillary system within itself. Hence from the numerous irritating causes to which this great vascular network is being constantly exposed, engorgements easily arise, vascular dilatation as easily follows and becomes chronic. Medical treatment in this class of affections is constitutional, or alterative, or local and astringent. I propose now to bring to the professional notice the employment of a means combining in a very great degree active alterative and astringent properties to be used internally as a general remedy in diseases of the skin, and by virtue of these properties, when introduced into the circulation, and brought in immediate contact with the dilated capillaries, has afforded the most gratifying results. One of the principal, if not the leading difficulty, met with in the treatment of affections of the skin, particularly the chronic forms, is the constant tendency to vascular dilatation, with the usual consequences, thickening and induration of tissue.

The employment of the chloride of iron internally as a potent means of controlling vascular action for the arrest of hemorrhage, purulent and serous discharge, is a time-honoured remedy. But to suggest its application as an internal remedy for the several classes of cutaneous disease on the same principle, I am aware may give rise to controversy.

The action of this agent on the extreme vessels, when introduced internally, is of so prompt and decided a character as to induce the belief that it suffers but little chemical change in its passage through the circulation. Indeed its action, when administered either internally or externally, only differs in degree, such is its certainty. As previously stated, one of the leading considerations in the treatment of cutaneous affections is the control of the active and passive forms of vascular dilatation. It is excessive engorgement which converts the discreet into the confluent form of smallpox. It is passive engorgement or dilatation, which converts a transient cutaneous affection into a chronic form, of a duration often measured by years. What is termed the *hæmostatic* power of the chloride of iron, which consists in a peculiar action on both vessels and fluids, tending to diminish the capillary circulation, and the arrest of hemorrhage, affords an interesting example of a principle of action, which can with equal propriety be applied to the control or regulation of the identical capillary circulation under circumstances of dilatation, engorgement, or inflammation. The simple fact, which is incontestable, that this preparation has the power to arrest or diminish the secretion or excretion of pus, or the exudation of lymphous matter, is sufficient evidence of its influence over the operation of those principles involved in the process of inflammation. As a conclusive example of this influence over vascular action, and even blood metamorphosis, and the process of nutrition, the following case is noted :—

Mrs. W——, a woman of sixty years, had been suffering for more than two years from aneurism of the arteria innominata, which had grown to dimensions greater than a hen's egg, encroaching on the surrounding organs, and impairing their several functions greatly. The chloride of iron was prescribed in doses of forty drops four times per diem, and persevered in for a period of four months. Under the favourable influence of this treatment the tumour gradually diminished, while the abnormal action of both heart and artery subsided correspondingly, affording inestimable relief and comfort to the suffering patient. When the treatment was suspended scarcely a vestige of the tumour remained, while the general health was thoroughly renovated.

The treatment and subsequent results in this case afford indubitable testimony of the power of the chloride of iron over the action and dilatation of the larger class of vessels, and is of a character to induce the belief that it is one of the most valuable remedies in aneurism in our possession.

The remedial power of chloride of iron for arresting the progress and extension of cutaneous inflammations.—Doubtless the *diffuse* character of cutaneous inflammations, and also the tendency to assume the chronic form, are due in great part to excessive vascular communication, and a low standard of blood plasticity or nutrition. Impoverishment of blood, and decline of the blood-making powers, are such common accompaniments of cutaneous affections as to need no comment here. Indeed it may be held as a principle that in diffuse inflammations of the skin, with tendency to rapid extension, the nutritive or plastic materials of the blood are deficient; while at the same time a high standard of blood plasticity constitutes an element for the limitation or circumscription of such inflammation. For the purpose of promoting these favourable blood changes we possess no agent more active than this preparation of iron. It is equally applicable to the acute or chronic forms of cutaneous affection, as variola, erysipelatous affections, carbuncle, chronic pustulous or vesicular eruptions.

After this brief but general statement in regard to the valne of chloride of iron in affections of the skin, it becomes proper now to treat of the more special application of the remedy.

Action of chloride of iron in confluent and malignant forms of variola.—As a general thing, though not always, the extent of cutaneous inflammation and suppuration, arising during the progress of smallpox, denote the gravity of type. Hence in the management of this affection, the condition of the skin becomes the absorbing consideration.

During an extensive experience in epidemic smallpox, from previous knowledge of the peculiar action of chlor. ferri in diffuse or erysipelatous inflammations, I was induced to test the powers of the remedy in the former affection, on the principle of its influence to control, curtail, or diminish such forms of inflammation. And now, after having fairly tested the value of this remedy in the grave and malignant forms of smallpox, I am prepared to give my testimony in its favour.

The action of the remedy in all the cases tested was gradual, but apparent and decided; simultaneously modifying and diminishing inflammatory action, and curtailing the process of suppuration, as it were confining these processes to safe limits. Of its effects, not the least valuable in this disease is that on the tedious and exhausting suppuration attending it. For the amelioration of this symptom the chloride of iron, in my own experience, is incomparably superior to all other means. And here I will take the liberty of digressing from the main subject, for the purpose of stating a case in testimony of the fact.

A youth of sixteen had sustained an enormous burn of the right lower extremity, from the lumbar region to the toes, which caused the entire skin of the injured parts to slough, leaving the fascia at some points, and the muscles at others, entirely exposed. When I saw him three months after the reception of the injury, the denuded surface was covered with enormous masses of granulation, from which flowed forth incredible quantities of purulent matter daily. The patient was suffering from extreme exhaustion and emaciation, and was far advanced in hectic. Large and frequently repeated doses of chloride of iron were prescribed in connection with generous diet, I believe as much as ʒss every five hours, during the first week. Under this system of treatment the improvement was decided and progressive, and finally ended in complete recovery; and, to my utmost astonishment, there was but little thickening or cicatrization of the skin left, where before there were enormous and unsightly granulations, filled with engorged capillaries.

To return to the consideration of the treatment of smallpox; the two following cases may be stated as examples of the efficiency of the remedy.

Mrs. P., in the seventh month of pregnancy, contracted smallpox, three of her children having it at the time. Abortion occurred during the first day of eruption. The case proved to be a most malignant confluent type of disease. The entire surface was covered with eruption, extending over the throat and vaginal surface; the face and tongue were also greatly swollen; the constitutional symptoms were violent. Having, as I now supposed, a favourable case to test the powers of the chloride of iron as an agent to control severe inflammations of the skin, I eagerly embraced this opportunity to put it in practice. The remedy was prescribed in quantities of ʒss every four hours, after the operation of an aperient. Subsequently the variolous pharyngitis becoming very violent, the chlorate of potash was added. Alarming symptoms of general prostration also presenting themselves were counteracted by the free administration of stimulants.

This method of treatment was persevered in from an early period of the eruption, with but little variation, and in the usual time the patient passed through the different morbid stages triumphantly. It has been my lot to observe but few cases of smallpox of a more alarming character than this. From the enormous amount of eruption I had apprehended copious suppuration. To the contrary, the process of maturation was greatly modified, and the attending suppuration proved moderate.

It may be claimed even for the chloride of iron in smallpox, that it possesses very considerable abortive powers. In that most alarming and grave complication, where the tongue is greatly enlarged, the powers of articulation and deglutition are almost destroyed, this combination of remedies is valuable.

Mrs. M., a woman aged 55, contracted a most malignant attack of confluent smallpox, attended with all the usual indications of alarming adynamia, as great vital prostration, feeble and frequent pulse, cold extremities, delirium, dry tongue, and diarrhœa. She was ordered the chloride of iron in doses of 40 drops every four hours, with a liberal allowance of alcoholic stimulants and nutritious diet. The system responded kindly to the action of the remedies; the type of disease soon became modified; and the patient passed through the attack with unexpected safety and rapidity. In neither of these cases did the amount of suppuration correspond with the severity of symptoms. Nor was the process of maturation fully developed. These cases are merely a representation of others of a similar character, which were subjected to identical treatment with equally favourable results.

Carbuncle.—Carbuncle, though usually not classed with cutaneous affections, yet is a malady so thoroughly involving the skin and subjacent tissue, as to entitle it to a place among them. The principle of regulating the circulation, or curtailing or diminishing it to an inflamed point—or, in other words, changing the character of *diffuse* forms of inflammation, and converting them into circumscribed forms, and establishing certain well-defined limits for their isolation by internal means possessing very active astringent or hæmostatic properties—is simply analogous in action to that of the same means when applied for the arrest of hemorrhage. In both instances the agent is brought into immediate contact with the capillary vessels and their contents. The inflammation of carbuncle is peculiarly destructive, with a strong tendency to extend to all neighbouring parts, and with no power for the establishment of fixed limits. Hence in treatment, the leading considerations are, to change the diffuse character; establish defined bounds, and promote moderate healthy suppuration; to enable the system to arrest disease, and to throw off sloughing material. For the promotion of these objects no remedy, in my own experience, acts so promptly, when given internally, as the chloride of iron.

The following case may be accepted as an example:—

Mr. H., aged 55, of previous intemperate habits, was attacked with large and very dangerous carbuncle on the right shoulder, which presented a disposition to rapid extension and sloughing. The general indications were eminently typhoid.

Chloride of iron, in quantities of ʒss every four hours was prescribed in connection with generous diet and stimulants, with the best effects. It was not long before there was a perceptible decline in the inflammatory action, while a well-defined boundary was being clearly established between the healthy and diseased parts, and the suppurative process was being modified. A very large slough was eventually thrown out, leaving a cavity behind filled with healthy granulations. His recovery was both rapid and continuous.

Chronic pustular and vesicular affections.—After a very considerable experience in the use of the chloride of iron in these classes of affection, I am warranted in the expression of great confidence in its efficacy; not only for the removal of the immediate local affection, but for the correction of those prime causes of a predisposing character. In all stages, but more particularly in the advanced stage of that very annoying and loathsome affection, chronic eczema, when ulceration and suppuration are fully established, and the integument has become thickened, indurated, and laid open with numerous fissures, the chloride of iron treatment is followed by the best results.

For the full realization of these results, time and patience are requisite; but these are always manifested by diminution of the copious discharges, reduction of cutaneous engorgement, and a better regulation of capillary circulation, and finally by a restoration of the thickened and indurated integument. For both promptness and permanence of action, it is far preferable to the preparations of arsenic, iodine, or mercury in common use. It is particularly adapted to the tender age of children, whose delicate digestive organs cannot always tolerate the latter articles. The action of the remedy is gradual in this class of affection; but in the end success will always crown our efforts, and may be calculated on almost with a certainty, even when all other means have failed.

Impetigo and Ecthyma.—One of the most interesting features presented in the action of the chloride of iron is the remarkable influence which it exerts over the formation and excretion of pus, by operating through the channel of the circulation. Hence, through this power to control and regulate the process of suppuration, and suppurative inflammation, it is most admirably adapted to the treatment of this class of chronic affections, in which suppuration is a leading element. The action of the remedy in impetigo and ecthyma is decided and often speedy. Under the administration of the chloride of iron, I have not unfrequently observed the chronic ecthyma of children to disappear in a period of ten days. It also prevents or removes another very annoying feature in this affection, tedious ulceration.

Phagedenic affections of the skin.—In this type of diseases, which are so prone to march on in their progress of destruction, regardless of treatment, the chloride of iron, in my hands, has afforded results superior to all other means. The character of the peculiar destructive ulceration as well as the inflammation becomes changed; the progress of ulceration arrested; and, finally, granulations take the place of sloughs. In that variety of phagedena appearing during the progress of syphilis, and where the preparations of mercury become offensive to the system, and cannot be employed, I find the internal use of chloride of iron and chlorate of potash combined most valuable correctives.

Both the officinal "*tinctura ferri chloridi*" and the solution in water of the salt, have been used by me, but I regard the former as the most efficacious.

Art. XIII.—*Shoulder Presentation in Four Successive Labours—Version accomplished in the last two in the Position on the Knees and Breast.* By Charles C. Hildreth, M. D., of Zanesville, Ohio.

Mrs. Myer, residing in Zanesville, of German descent, of strong, vigorous, muscular habit, and large pelvic development, has had the misfortune to have the presentation of the arm in each of her last four labours. This is of exceedingly rare occurrence, and can be explained perhaps by the great capacity of her pelvis laterally, and a slight contraction of the same in the antero-posterior diameter. Mrs. M. informs me that up to this time she has been five times confined. In the first labour (occurring before she came to Zanesville) the presentation was natural, but delivery was not accomplished until the forceps were used, after many hours of suffering. The child was born living.

July 8, 1861. I saw Mrs. Myer in her first case of arm presentation. She had been in labour for two or three days, in the hands of an ignorant midwife, who had endeavoured to deliver by violent traction on the presenting arm. The husband finally becoming alarmed, sent for my friend Dr. Bell. The doctor, after getting the patient under chloroform, endeavoured to turn, but failing, sent for me in consultation. On my arrival, I found the patient greatly exhausted, the uterus rigidly contracted, the child firmly impacted in the pelvis, and dead. Getting her again well under chloroform, I also made an effort to turn, and failed. The child was too firmly impacted to be moved by my efforts. Being perfectly satisfied that the child was dead, as a last resort we agreed to amputate at the shoulder joint. This being accomplished, Dr. Bell turned and delivered without much difficulty. The patient recovered rapidly.

Aug. 4, 1862. Mrs. Myer was again confined. Dr. Bell was called, and again found a shoulder presentation. The liquor amnii was discharged, and the uterus so firmly contracted that he could not succeed in turning. After repeated efforts he sent for me in consultation. I found the patient in very much the same condition as at the first labour. We gave chloroform, morphia, the warm bath, &c., in order to relax the rigid contraction of the uterus, but without avail; we signally failed to turn. The funis coming within reach, we readily ascertained the death of the child, and again (as a last resort) amputated at the shoulder joint. Without much effort we then turned and delivered. Again the patient did well.

Feb. 4, 1864. Mrs. Myer was again confined. Her family physician, Dr. Bell, being quite ill, I was summoned to attend her. On my arrival Mrs. Myer informed me that the waters had broken on the day previous, and had been freely discharged, and that she had active pains. Making an examination I found again the arm in the vagina, and the uterus firmly contracted. Putting her immediately under the use of chloroform, with one hand over the fœtal head as felt through the abdominal walls, and the other in the vagina, I made a strong effort at version, but failed. This effort was repeated, the patient lying on the left side, and on the back. I failed in both cases to dislodge the shoulder from its position. Judging from the previous labours, and from the size of the arm in the vagina, that I had a large and heavy child to deal with, I thought perhaps the force of gravity might aid me in its delivery. Placing my patient on her face and breast without a pillow, and directing her to elevate her hips as high as possible while on her knees, and having while in this position put her under chloroform, I again attempted version. Passing my hand into the vagina, I was much gratified to find the arm by mere force of gravity receding into the uterine cavity. The uterus was pendulous and so far relaxed that with the greatest ease I pushed up the shoulder and arm, caught the feet, and brought them through the os uteri. I noticed also that while in this position my patient made no voluntary efforts to bear down or in any way to resist my manipulations, and that my hand and arm moved around in the uterine cavity with unusual ease and freedom. Having accomplished the version, the patient was turned again upon the back, the chloroform discontinued, and a full dose of ergot given. In a few minutes I had the pleasure of delivering her of a living child.

July 23, 1865. Mrs. Myer was again confined. Being absent from home when first sent for, I did not see her until she had suffered several hours of hard labour. As usual, I found the arm in the vagina, and the uterus firmly contracted. Having no chloroform with me, I sent for it at once to the drug store. During the absence of the messenger I made an effort to turn, the patient on the back, but failed to dislodge the shoulder. I then placed the patient on the knees and breast, and with the greatest ease pushed up the shoulder and arm, caught the feet and brought them through the os uteri. Again I noticed but very little resistance on the part of the uterus, or on the part of the mother, and much less suffering than is usual in this operation. The version accomplished, the patient was again turned upon the back, a full dose of ergot given, and in a few minutes she was delivered of a living child. Chloroform was not given in this case, as the delivery was accomplished before the return of the messenger.

Remarks.—In recommending my professional brethren to try the position on the knees and breast in all cases of labour requiring version, I may perhaps be suggesting nothing new. I am well aware that Dr. Sims first suggested this position for the operation of vesico-vaginal fistula, and that it has been advised in cases of prolapse of the funis, and in cases of inversion and retroversion of the uterus; but if any author has advised this position in all cases of labour requiring turning, I must confess my ignorance of the fact. That it will be found decidedly the best position for this operation I am well convinced, and for the following reasons. 1st. We have the force of gravity to aid us. The weight of the child naturally drags the presenting part from the os uteri or pelvic cavity, and by so much relieves the impaction. 2d. The woman cannot, in this position, to any extent exert her voluntary muscles in bearing down. 3d. We get rid, in a great measure, of the superimposed weight of the abdominal viscera, and the resistance offered by the promontory of the sacrum, should any part of the child be impacted below it. 4th. The liquor amnii is much more certain to be retained until we accomplish the version. 5th. The uterus with its contents recedes from the spine, and by force of gravity tends to relax the abdominal muscles, and hence favours our manipulations. 6th. It is more than probable that in this position the uterus will be found physiologically to contract less violently and relax more readily than when the patient is on the side or back. This has certainly been the fact in the cases so far observed. In conclusion, allow me to remark, that in our cases of version, whether podalic or cephalic, we are too apt to neglect the very decided advantage we gain from the use of the hand on the abdomen over some prominent part of the child. In the position upon the knees and breast, our external manipulations will prove doubly valuable and efficient in accomplishing version.

Art. XIV.—*Case of Ovariotomy.* Reported by James E. Reeves, M. D., Fairmont, W. Va.

A report of the following case has been purposely delayed in order to test the permanency of recovery. Unfortunately, it has too often happened that cases of ovariotomy have been reported as soon as the patients were taken off the operating table and comfortably placed in bed; or if not thus hurriedly, within the next few days succeeding the operation, and the report concluded by the remark that "the recovery of the patient is beyond doubt, &c.," after which we have not been informed whether death or recovery—partial or complete—was the result.

On the 12th of July, 1864, I was called to meet Dr. M. Campbell, of Parkersburg, W. Va., in consultation upon the case of Miss Maria C——, of Fairmont, and obtained the following previous history of the case:—

Patient, æt. 29; of healthy parents; height five feet four inches; average weight, when in health, 120 pounds; of delicate frame; dark hair and small gray eyes. During the past year she had menstruated irregularly—the last *return* having been in the early part of May, and it continued but a few hours, accompanied with much pain. About two and a half years ago, attracted by "stinging pains" in the lower part of her abdomen, she noticed a slight fulness in the left iliac region—somewhat tender on pressure, which continued to increase at a moderate rate until something over a year since, when her increase of size became so marked as to attract the attention of her acquaintances, some of whom were not as charitable in attributing the *cause* as they should have been. From the last mentioned date to the present, she has been gradually losing flesh and strength, has had no appetite, very often nausea and vomiting; bowels irregular; suffered constant pain through the sides and back; and, recently, has complained much from shortness of breath when lying down, for which reason she has spent most of the nights in the sitting posture.

For the relief of these symptoms, and, if possible, to improve her general condition, Dr. Campbell had prescribed alteratives, tonics, and stimulants, paintings of iodine, pressure, &c. &c., but all to no benefit.

Diagnosis.—Encysted dropsy, probably unilocular. The abdomen fluctuates distinctly on percussion, the tumour smooth and regularly protuberant, changes but little with altered condition of the patient. When on her back, dulness on percussion at the umbilicus, with marked resonance in the lumbar region; no bulging of the sides of the abdomen. As there have been evidences of inflammatory action, adhesion to the adjacent parts is probable. In this condition, life having become a burden, and the patient unwilling to submit to the severer operation for removal of the cyst, tapping was agreed to, and the operation performed July 12th, 1864, by Dr. M. Campbell, in the usual manner. The sac contained *eight quarts* of the characteristic fluid; and after being emptied, a soft movable tumour, about six inches in diameter, could be detected, occupying principally the left iliac quarter. Injection of iodine (as proposed by Professor Simpson) to restrain refilling of the sac was considered, but not practised, for the reason that such procedure was esteemed but little less dangerous than the operation for extirpation. The patient suffered no shock from the tapping; and was placed in bed, with bandage so adjusted as to keep up firm but equable pressure. From this date she was in reporter's care. Very little fever followed; and for several days the patient expressed herself as being entirely comfortable. Her appetite improved, and a slight increase of strength was apparent; but the lapse of two weeks put an end to all her hopes of recovery. The sac from this date refilled with singular rapidity; and, by the 1st of October, she was even more uncomfortable than before the operation of tapping. Meanwhile Dr. Campbell had visited her frequently; and, to encourage consent to an operation for entire removal of the cyst, the favourable opinion of the venerable and accomplished surgeon of the U. S. Army Gen. Hospital at Grafton, Dr. S. N. Sherman, a resident of New York, who had seen the case, was obtained. The patient becoming convinced that, at the present rate of increase of suffering, she could survive but a few days, or weeks at most, and that the proposed operation, even should it prove fatal (and its terrible character was fully explained), would be preferable to longer suffering, consented to the operation; whereupon Wednesday, October 5th, was fixed for its performance.

Oct. 4. A dose of castor oil was administered this evening, and next morning an enema, by which the bowels were completely emptied. Expecting Drs. Sherman and Campbell to arrive by the 1.30 P. M. train from Grafton, arrangements were made for the operation. By this time she had become anxious for the hour to arrive when she should be placed upon the operating table, and in view of the ordeal through which she was soon to pass, manifested a heroic cheerfulness. We were then informed that Drs. Sherman and Campbell would not arrive until the next day.

At this sad disappointment the patient wept bitterly; but the morrow, Thursday, found her with spirits as buoyant as before. An enema was administered, and, in a few hours afterwards, thirty drops of tinct. opii to quiet and prevent peristaltic action.

Operation, October 6th, 1864.—Present, Drs. Sherman, and Campbell; and, by invitation, Dr. M. Dougherty, of Grafton; and Dr. William Frey, of Brandonville, West Virginia. The bladder having been emptied by the catheter, and the patient placed in bed clothed, for the operating table, temperature of room 70° F., the reporter, to whom was intrusted the administration of the anæsthetic, proceeded, at 2.45 P. M., to administer a mixture of equal parts of sulphuric ether and chloroform; but, on account of its slow effect, chloroform alone had to be employed. At 3.25, the patient was removed from the bed and placed upon a table covered with blankets; her legs, enveloped in heavy flannel drawers hanging over the end of it in such a way as to evenly expose the abdomen. At 3.30, Dr.

Campbell made the first incision—about four inches in length downwards from a point one inch below the umbilicus, directly in the mesial line. By a few touches of the scalpel, the structures along the linea alba were divided, the abdominal cavity opened, and the tumour exposed to view.

The sac was then tapped with a large trocar, and *ten quarts* of fluid, more viscid than before, evacuated. At this juncture the patient began to vomit, when further proceeding for the time was suspended. Soon, however, the stomach became quiet, and Dr. Sherman introduced his hand and found anterior adhesions to exist. These he gently broke down, and then made an attempt at removal of the sac, but failed because of the smallness of the incision. This he enlarged, so as to reach the umbilicus, by a few clips with the scissors, after which the removal of the mass was possible. But here another difficulty arose: on attempting to lift out the mass, notwithstanding the careful pressure made upon the sides of the incision by the assistants, several coils of the intestines protruded, and on attempting their return, four or five inches of the ileum was found adherent to the sac. This adhesion was broken down with the finger by Dr. Sherman with great delicacy; after which, with the scissors, he clipped off from the bowel the loose fragmentary tissue that had bound it to the sac. The bowel was then returned, the mass completely lifted from the abdomen, and the *pedicle* exposed. At this stage of the operation vomiting recurred; and in spite of the best directed efforts, a coil of the intestine protruded again; and, as before, the operation had to be discontinued for a time.

The stomach quiet, Dr. Sherman proceeded to the separation of the pedicle. Its length was about two inches and a half; width about one inch and three-eighths; and (after drawing the tumour well forward) it was transfixed with a large needle carrying a strong silk double cord, and tied on either side. The *clamp* was then applied above the constricted portion, and the pedicle separated.

Contrary to the practice of some operators, the peritoneal investment of the pedicle, corresponding to the line constricted by the ligature, was not dissected off; and the only particular care taken by Dr. Sherman, was, in passing the needle, to avoid an artery or vein, and to be sure that the ligature was tightly drawn. Having gotten rid of the sac, attention was turned to the root of the pedicle and its connections, when several little cysts, from the size of a pea to that of a filbert, were found. These were ruptured between the fingers and their contents expelled. The right ovarium was then examined, and found in normal condition. To rid the peritoneal cavity of accumulated blood and serum, soft flannels, wrung out in warm water, and made into small folds, were pressed into the abdominal cavity; and this process of cleansing continued until the flannels were returned without stain.

The abdominal incision was then closed by *five* twisted and *two* interrupted sutures—none of which transfixed the pedicle. The pins employed were the ordinary small sized steel darning-needles, which, after being passed through the lips of the incision, were cut off to the proper length. Much care was taken to bring the edges of the peritoneum exactly in contact, and to close the entire line of incision as evenly and smoothly as possible, also in tightening the silk twist around the pins. Long broad strips of plaster were next applied; and after the *clamp* had been turned in position exactly across the line of incision, with the two long ends of the pedicle ligature looped over it, several folds of soft carded cotton were laid over the entire abdominal surface, and over all, a well-fitting laced flannel bandage, prepared for the purpose, was applied. The patient was then removed to bed (5 o'clock), one hour and a half from the time the first incision was made by Dr. Campbell. When placed in bed, she had entirely recovered from the anæsthetic; her pulse 125, regular, and of good strength, but respiration somewhat laboured; extremities warm, and no symptom of collapse followed. Complained of no pain, save a dull aching along the course of the right crural nerve. Administered *four grains* of solid opium—the dose to be continued every three hours until further ordered. To have pounded ice and toast water.

The patient having been placed comfortably in bed, attention was directed to the tumour removed. It was placental shaped—about seven inches in diameter, and weighed six and one-fourth pounds avoirdupois.

Near the pedicle, and against the body of the tumour, several small cysts about the size of a large cherry were attached by miniature pedicles not larger than a common sewing thread.

On laying open the tumour with the knife, it was found made up, in the main, of separate cells, varying in size from that of a filbert to that of a hen's egg, the partition walls tough, and resembling cartilage. The smaller cavities, sometimes communicating with each other, contained a cream or pus-like fluid; the larger, for the most part, a glutinous, viscid matter.

7th, 2 A. M. Dr. Sherman, who remained with the patient, emptied bladder with catheter. She has slept but little; vomited twice; pulse 135. 9 A. M. Resting comfortably; pulse 140; respiration 22; stupid from the effect of opium, but still complains of pain in the right thigh and leg. Says she is hungry. 12 M. Emptied bladder with catheter, which afforded her a feeling of greater comfort. Nausea and vomiting since last record. To have *two* grains of opium every two hours. Drs. Sherman, Campbell, and Dougherty bade the patient good-bye, and the case was left entirely in reporter's care. 6 P. M. Pulse 135; respiration more hurried; a few minutes since, vomiting came on; fluid ejected of fecal odour, and with it the last dose of pills (opium) was brought up. 11 P. M. But little nausea and no vomiting since last record. Skin in fine condition; respiration easy; pulse 130; emptied bladder and changed her position.

8th, 7 A. M. Suffering uneasiness from distended bladder. Catheter used. Has been comfortable during the latter part of the night, but did not sleep. Skin moist and of uniform temperature. No pain or soreness on changing her position. Pulse 120; respiration 16; but little nausea. Wants something to eat. 11 A. M. Sick, and making an effort to vomit; no pain or soreness of the abdomen; pulse 124; respiration 16; changed her position. Asks again for food. 2.30 P. M. Wants her position changed; a little nausea; respiration 18; skin in excellent condition. To have pounded ice, freely, as she will take it, and continue two grains opii every two hours. 4.20 P. M. Has vomited since last record. Emptied bladder, and changed her position. No pain or soreness complained of; respiration easy and natural; skin warm and moist; gurgling noise in the bowels, and escape of flatus; vagina cool. At 6 P. M. she was very sick at the stomach, and vomited. Evacuated her bladder with catheter, and changed her position. Complains of being very hungry. Allowed a little green tea.

9th, 4.30 A. M. Has not slept during the last two hours; has been vomiting; emptied bladder. 2.30 A. M. Been sick and making efforts to vomit during past two hours. Suffers no pain; pulse has continued 120, but is fuller; respiration nominal. Emptied bladder, and changed position to *left* *side*, for the first time since the operation, but found that position uncomfortable, and after ten minutes was turned upon her back. In fine spirits. Very hungry, but nothing allowed but toast water and pounded ice, of which last she swallows a saucerful about every hour. The same dose of opium continued as before ordered. 1.30 P. M. Emptied bladder. Condition same. 6 P. M. For the past half hour has been very sick at the stomach, and vomited freely. Emptied bladder. Pulse 125; respiration normal; mind wandering. Ordered spiritus ammon. aromat. every hour. 10 P. M. Thinks she has not been so often sick at the stomach since taking the ammonia. Pulse 120; skin good; has slept a little; mind sound. Asks for *toast water or tea;* says she is "almost starving." Emptied bladder. Continue opium, spirits of ammonia, and the pounded ice.

10*th*, 2 A. M. Emptied bladder, and ordered same treatment continued. 6 A. M. Very comfortable; says the night, thus far, has been the *best* she has passed, notwithstanding she was quite sick at the stomach once or twice. Emptied bladder and changed her position slightly. 10 A. M. Comfortable. Emptied bladder and changed position. 2 P. M. Has been sleeping soundly. Emptied bladder. 6 P. M. Was sick two hours since and made an effort to vomit. Emptied bladder and changed position. Midnight. Has been sleeping an hour or two. Emptied bladder.

11*th*, 6 A. M. Says the last has been by far the most comfortable night she has spent; has had no sickness at the stomach; emptied bladder. 2 P. M. Removed dressings, clamp and pins. The abdomen flat, cool, and the line of incision above and below the protruding *pedicle* well closed and healing nicely. The dressings remained all dry, except immediately around the pedicle; no fetor. After removing the clamp, the pedicle secured in position by tying the ends of the ligature over a piece of palm-leaf. Entire condition of the patient favourable; to have small quantities of milk and chicken jelly. The usual dose of opium to be continued. 6 P. M. Has had distressing nausea since the dressing, and once vomited freely. Feels a little soreness along the line of incision. Expresses her thanks for an increased allowance of food. Position on the back since the dressing; emptied bladder; urine pale; the usual quantity (4 oz.) drawn off. Midnight. Far more comfortable; wants a greater allowance of milk, which was granted; emptied bladder; continue opium and ammonia.

12*th*, 6 A. M. Patient bright and cheerful; has spent a very happy night; hungry; emptied bladder. 12 M. Evidently not so comfortable as at morning visit; pulse 128; has suffered nausea and made several efforts to vomit; no pain or tenderness of the abdomen; emptied bladder. 2 P. M. Feels decidedly more comfortable than when last seen; now and then complains of pain through the right hip. 6 P. M. More comfortable generally; has been sleeping a little; emptied bladder. Midnight. Emptied bladder.

13*th*, 6 A. M. Boasts of the good night she has spent; no nausea; very cheerful; hunger increasing; emptied bladder; to have an increased allowance of milk and chicken jelly. 12 M. Very comfortable; emptied bladder. 6 P. M. Continues to improve; says she feels well enough to be out of bed; very hungry; no soreness on pressure over the abdomen; can move her feet and legs with ease; pulse 118 and of increased strength; emptied bladder; urine not so high coloured as heretofore. Midnight. Has been sleeping soundly; emptied bladder.

14*th*, 6 A. M. Slept well last night; pulse 118 and of good strength; very hungry; emptied bladder. 12 M. Comfortable; removed dressings;

but little discharge from about the pedicle; the line of incision above and below, well closed; abdomen slightly tympanitic, but not the slightest soreness or pain on pressure; allowed *clean linen;* emptied bladder; opium and spts. ammon. aromat. to be continued; to have a half teacupful of milk at a time. 6 P. M. Has spent a delightful afternoon; pulse 118; not the slightest pain or soreness complained of on changing position; very hungry; emptied bladder. Midnight. Been sleeping soundly; emptied bladder.

15th, 6 A. M. Feels so well this morning that she thinks she could get out of bed unassisted; asks for greater quantities of milk and chicken jelly. Pulse 116. Bladder emptied. 12 M. Pulse 110; a little tendency to sickness at the stomach; otherwise condition as good as at last record. Abdomen slightly tympanitic; emptied bladder. 6 P. M. Removed dressings. Abdomen less tympanitic; discharge (very small) from the pedicle, without fetor; and the line of incision, above and below, perfectly closed and dry. Midnight. Comfortable; has been sleeping soundly. Pulse 106; emptied bladder by her own effort. Very hungry, and asks for more food.

16th, 6 A. M. Rested well last night; pulse 112; very cheerful; no sickness at the stomach. Voice markedly increasing in strength. 12 M. Was very sick and has vomited. Pulse 108; skin in good condition. 2 P. M. Examined dressings; the pedicle doing well. To have her bowels moved by injection of soap and water; and hereafter, the dose of opium (2 grs.) to be gradually withdrawn. 6 P. M. Bowels have been moved, and the effort has prostrated her considerably. To have brandy toddy, and the accustomed 2 grs. opium for the next dose. Midnight. Has slept well and feels much revived; pulse 108, and of increased strength. Bladder emptied by natural effort. Continue brandy toddy, and take one grain of opium every two hours.

17th, 6 A. M. Very comfortable; passed a refreshing night; pulse 104; Tongue not so dry, and thirst diminished. To have more food; animal broths, fruits, &c. Directed to make an effort to empty her bladder every six hours. 5 P. M. Spent a pleasant day. Pulse 96; very hungry. Examined dressings, and on making very gentle traction, the ligatures from the pedicle came away.

18th, 7 A. M. Pulse 88; during the early part of the night felt uncomfortable in the bowels, and, at her own request, an enema of soap and water was administered, which partially emptied the rectum, and comfortable sleep followed. This morning she is, as she says, almost well. To have, hereafter, *one* grain of opium three times a day, or until further ordered.

19th. Complains of uneasiness of the bowels, and a constant desire to stool. Ordered injections, by which the large bowels were thoroughly emptied; to have opium (1 gr. doses) but twice a day.

21st. She was able to quit her room, and take food more liberally. Opium was now entirely discontinued; and from this date her recovery was rapid and without drawbacks.

31st. Well enough to go out of doors on foot, and was discharged.

Remarks.—The reader will notice that the *after management* of this case was exceedingly simple, and that *opium* (administered largely, it is true) and the *aromatic spirits of ammonia* were the only medicines employed. The *first* exposure of the abdomen, and removal of the dressings, was on the *fifth day* after the operation, when both the *clamp* and *pins* were taken away. The second dressing was removed *three* days later; after which there was a daily examination and removal of the dressings up to Monday (the 27th of October) the eleventh day after the operation, when the *ligature* from around the *pedicle* came away.

The bladder was emptied every four or six hours for ten days, and not over four ounces of urine allowed to accumulate at a time—a care soon found essential to her comfort. The bowels were not moved until the *tenth day*, and then by injection. For *five days* there was almost entire prohibition of food—the patient taking nothing but *toast water* and *pounded ice*—of which latter she consumed large quantities, not so much to allay thirst as to quiet and prevent sickness at the stomach—after which date, milk and chicken jelly were cautiously administered. At the expiration of six weeks she was able to run about town, and by the close of the next *seven months* from the date of the operation, she was entirely restored to health. Her *first* menstrual *term* came on the third of May, 1865, since which period she has been menstruating every four or six weeks without difficulty. At present, January, 1866, she is in perfect health, very fleshy, and engaged in teaching one of the common schools five miles in the country; and sometimes, when the weather is fine, she ventures to travel this distance on foot. Her abdomen is smooth, and at the point in the mesial line, which was engaged by the pedicle, there is not the least irregularity or contraction.

ART. XV.—*Reduction of an Inverted Uterus of Eight Months' Duration.* By THOMAS ADDIS EMMET, M. D., Surgeon to the State Woman's Hospital, New York. [Read before the New York Obstetrical Society, March 6, 1866.]

Dr. GOULEY, on the 17th of February last, requested Dr. Noeggerath and myself to see a case of inverted uterus under his charge in St. Vincent's Hospital of this city. With his permission I have reported the case, from the fact that the reduction was effected by the method proposed by myself and described in full with a successful case in the last January number of this journal. The patient was about twenty-four years of age. In June last, at full term and in perfect health, she was delivered of her second child by a very rapid labour, in which she had but one severe expulsive pain, just as the head was expelled. Until within a few moments previous to delivery, she had not found it necessary to lie down. The after-pains came on at once; they were severe, and lasted longer than had been the case after the birth of her previous child. From a short time after delivery until the reduction, there had been a constant show, which frequently amounted to a hemorrhage, and she presented the appearance of one who had been suffering from an excessive loss of blood. Her condition had been attributed to the existence of a polypus, which was supposed to be protruding from the os uteri, and she had been sent to the hospital for the purpose of its removal.

After much difficulty, the patient was gotten under the influence of ether by Dr. Ward, the house surgeon, at half-past two o'clock P. M. An examination was then made by one hand in the vagina, lifting the uterus above the pubes, and the other hand on the abdominal parietes; the two were thus so closely approximated as to leave no doubt in regard to the true condition.

Dr. Gouley, as well as Drs. Wm. H. Van Buren and Moses, who were present, concurred in the opinion of Dr. Noeggerath and myself. At my request, Dr. Noeggerath, after Dr. Gouley, attempted the reduction by his method of depressing one side into the canal and carrying this portion up first, as described in the note appended to the case reported in the last number of the journal. After an attempt of some fifteen minutes, he found it impossible to indent the body sufficiently, and desisted. I passed my hand into the vagina, and, for a while, endeavoured to put into practice his method, but found it impossible to do so to any extent. In fact, the organ was so dense, and was contracted to so nearly its natural size, that the case was not a fair one for testing his mode, nor was it one which could have been reduced by pressure at the fundus, as proposed by Prof. White, while it was in every respect favourable to the method I resorted to. With the left hand in the vagina, the four fingers were passed as far up as possible between the inverted portion and the neck, with the thumb in front, so that the body was encircled by the fingers, and the fundus rested in the palm. Then, with an upward and outward pressure at the same time, the neck was gradually dilated until the seat of inversion was reached by the frequent extension of the fingers. This manœuvre was persevered in, while during the whole time the organ had been lifted above the pubes, so that the other hand could assist in the rolling out of the parts by sliding upwards the abdominal walls, with a steady pressure over the posterior portion of the ring formed by the inversion. In less than half an hour the mass, as felt through the abdominal parietes, had doubled in size, the depression in the centre had become larger, and the shape changed from a circle to an oval. The fundus gradually passed entirely within the cervix, but, after this, the progress as appreciated from the fingers within the uterus was almost imperceptible, but the rapidly increased size of the mass and the diameter of the depression at the seat of inversion was recognized by all present. At the end of an hour, my hand in the vagina became so powerless, that without the aid of the hand over the abdomen, I was unable to feel the body of the uterus within its grasp. I finally requested Dr. Noeggerath to relieve me, and, by his continued manipulation, in about ten minutes the reduction was completed, after a conjoined effort of an hour and twenty minutes. The patient has continued to do well up to the present time, and has not had a bad symptom.

In consequence of the continued action of the fingers necessary, I am satisfied that it is beyond the power of endurance for one person to complete the reduction unaided in a case of long standing. I fully recognized the necessity insisted on by Dr. Elliot, as reported in the history of the previous case, that a change of hands should be frequently made, and I believe that the progress of any case would be materially increased by fresh aid every fifteen minutes.

This mode of reduction is of great interest, for it is applicable to all conditions of inversion of the uterus, while it has been successful after the other methods had failed, and the principle is certainly correct in returning first the portion last inverted. The aid of the other hand in steadying the uterus, and to assist in rolling out the inversion, is a most important feature. It is calculated, also, to lessen the risk of inflammation of the vagina if not of the uterus, for I have seen the vaginal wall lacerated and the attempt abandoned where the pressure was made at the fundus and the vagina put on the stretch, with no counter-resistance beyond the strength of its own walls.

TRANSACTIONS OF SOCIETIES.

ART. XVI.—*Summary of the Proceedings of the Pathological Society of Philadelphia.*

1865. *September* 13. *Remittent Fever; Albuminous Urine: Pigment in Blood: Death; Pigment in all Tissues of Body.*—Dr. WM. PEPPER read the following history of a case of this character:—

1. Franklin Bean, æt. 27, born in Maine, was admitted to the Pennsylvania Hospital September 10, 1865. Had been captain of a vessel running between Philadelphia and Georgetown, South Carolina; and, on the trip up, when all of his crew but two were seized with malarial fever, he with the two men worked the vessel to this port, so that by the day they arrived—Saturday, September 2, 1865—he was utterly exhausted—mind and body. He had a chill on Monday morning following, and was forced to go to bed on Wednesday, September 6. He has had no second distinct chill, but a continued febrile action with marked but somewhat irregular remissions. There has been occasional bilious vomiting, constipation of bowels, but neither cough nor epistaxis. On admission, at 10 A. M., his symptoms were those of intense prostration; there was considerable hebetude with occasional delirium, but generally he could be roused to answer; constant restlessness and jactitation, with painful feeling of præcordial oppression. Respiration sighing; pulse small, 108 a minute; tongue dry, but not heavily furred; belly tympanitic, showed no eruption; spleen somewhat enlarged; liver of normal size, but sensitive to pressure. His skin was hot and dry, and he evinced great thirst with utter anorexia. On morning of admission he took cinchonia sulph. gr. xxxvj, and whiskey at rate of f℥xv daily.

11*th*. There was still marked hebetude with jactitation. The heat of skin less, with more moisture; tongue very dry; respiration irregular, shallow or sighing; pulse 110, small and feeble; belly still tympanitic, although the bowels had been opened by an enema. Blood drawn from finger showed about normal average of white corpuscles; red corpuscles pale, many of them crenated, with several large black pigment masses. Cinchon. sulph. gr. xxx; whiskey f℥xxiv daily.

Toward night a distinct remission occurred; skin grew cold; pulse became smaller, and ran up to 148 in a minute, when he had quinia sulph. gr. xxiv, and additional stimulus with ammonia carb. gr. v, q. h. and external heat constantly applied; partial reaction was thus brought about, but the following morning, September 12, 1865, his pulse was again 145, and very feeble; delirium alternating with deepest hebetude; thirst gone; bowels quiet; skin hot and moist (temperature in right axilla 108° F.), on extremities shrivelled; pupils dilated; quinia sulph. gr. xxiv; stimulus and ammonia as before; prostration steadily increased; vomiting came on at 4 P. M.; convulsive movements at 5½ P. M.; death at 6 P. M.

Post-mortem four hours after death.—Body not much emaciated, but unusual rigor mortis.

Brain.—Darker than in health, somewhat congested on convexity. About half an ounce of effusion at base. Veins of cerebellum congested.

Thorax.—*Lungs* entirely free from adhesions; deeply congested posteriorly in lower lobes; heart healthy; muscular fibre red and firm; f℥ij serous effusion in pericardium.

Abdomen.—Stomach healthy. *Small* intestine was moderately distended by gas; contained fair amount of semi-solid feces, and had a large quantity of viscid mucus adhering to its inner coat. Toward the lower part of the jejunum a large number of reddish points were seen, but slightly elevated, evidently congested solitary glands. In the ileum the solitary glands were prominent and red, but none of them ulcerated. Peyer's patches were more distinct than usual, even up to the upper end of ileum, whilst toward the ileo-cæcal valve they were congested and very evident; but in no instance was there either abrasion of the mucous membrane, nor marked enlargement of gland elements. *Large* intestines presented no lesion; mesenteric glands not enlarged.

Liver was not enlarged, contained a great deal of blood, and was much mottled on outer surface, and in places, especially over left lobe, was decidedly bronzed. On section, the cut surface was glistening—presented neither prominence nor very marked congestion of acini—in colour, lighter than normal, but bronzed. Gall-bladder moderately full of black inspissated bile. Under microscope the liver cells were seen to be of good shape, containing one or two distinct nuclei, and dark-reddish granules, highly refracting, but irregular and angular in shape; there was also a great deal of floating granular matter and free masses of pigment. The bile contained the epithelium of gall-bladder, brown yellow granular matter and pigment masses.

Kidneys much congested. Urine drawn from bladder was decidedly albuminous, depositing granular casts, epithelial cells, fibrinous flakes, and pigment masses.

Spleen three times normal size, soft, and, besides normal elements, contained reddish granular fibrinous flakes; large free pigment masses and cells (in size and granular nature very much resembling white corpuscles of blood), with pigment granules apparently even in the nucleus; certainly the granules were in the cell contents.

Blood from portal vein, just above junction of splenic vein, contained many crenated corpuscles, a normal or slightly increased average of white corpuscles, and large black pigment masses.

Blood from vessels on convexity of brain contains crenated corpuscles also with hæmatine masses of same size and shape as those in other parts. It is to be regretted that circumstances prevented an examination of the brain structure itself.

Sept. 27. *Acute Infiltrated Tubercle Associated with Malaria; Death in Twenty Days.*—Dr. WM. PEPPER read the following:—

Arthur Pierson, æt. 18, was admitted to Pennsylvania Hospital at two P. M., September 16, 1865. He was born in England, of healthy parents, and for several years past has been following the sea. He arrived at this port from Liverpool about the middle of August, since when the vessel has been lying at one of the wharves in Richmond. He remained perfectly well until three weeks ago, when, as he was working in the hold of the ship, he was seized with violent frontal headache, vomiting, and prostration. He immediately retired to bed, and has remained there since. He seems not to have had any distinct chills nor even marked remissions; the bowels have been loose; no epistaxis; moderate pain in chest without cough until four days ago, when cough appeared with at first a slightly rusty sputum, but since then, without coughing very much, he has expectorated large quantities of glairy, yellowish-gray somewhat nummular sputa.

At 4 *P. M.*, when first seen, he was lying on right side, breathing rapidly. No emaciation of body was noticed; the face was sallow, not much flushed; the eyes dull, and there was considerable hebetude, although he could be roused to answer questions correctly. The tongue was dry and coated; slight sordes on teeth; the belly meteoric, but showed no eruption. There was slight increase of hepatic dulness with tenderness on pressure, but no marked splenic enlargement. Skin hot and dry; respiration very frequent; pulse 120 in a minute and feeble. There was no very severe cough, but frequent expectoration of large frothy sputa of glairy muco-purulent matter, containing some oil, squamous epithelium, large granular singly-nucleated cells and few blood corpuscles. *Physical signs* on right side were somewhat impaired resonance throughout; vocal fremitus and vibration marked. Respiration was rude over upper lobes anteriorly and posteriorly, with occasional sonorous and sibilant râles, and over lower lobe attended with fine crepitation limited to inspiration. On left side, percussion note was flat over upper lobe, anteriorly and posteriorly; over lower lobe anteriorly there was very slight resonance, but posteriorly it was again flat. Auscultation revealed over upper lobe fine crepitation limited to inspiration with obscure bronchial respiration; during expiration the crepitation seemed replaced by dry and moist râles in larger tubes; over lower lobe anteriorly there was coarse moist crepitation heard during both inspiration and expiration, with diffuse imperfect blowing respiration. The cardiac sounds were almost entirely masked by this crepitation. Vocal fremitus was increased considerably over lower lobe, and the vocal resonance slightly bronchial, but not very loud nor distinct. The movements of respiration were chiefly conducted by right lung, the movements of expansion of upper ribs and elevation of entire thorax being marked, whilst on left side the movement of expansion was absent, slight elevation being the only evidence of any respiratory effort. Dry cups were freely applied to back, and the whole thorax surrounded by a poultice. Whiskey f℥j with ammoniæ carb. gr. v, were given every hour.

8 *P. M.* Has rapidly sunk; there is now wandering delirium; hot, dry skin; respiration shallow and jerking, 63 a minute; pulse 156, a mere thread (pulse-respiration ratio 1 to 2½). Physical signs as before, excepting that expectoration has nearly ceased and there are more large mucous râles mixed with the crepitation. Death at 3 A. M., September 17, 1865, thirteen hours after admission.

Post-mortem six hours after death.—Body not much emaciated; surface sallow. Nails slightly clavate. Neither brain nor spinal cord examined.

Thorax.—Intense and minute congestion of both pleuræ and pericardium. Each pleural cavity contained nearly one pint of serous effusion, and there were a few points of recent lymph.

1. The right lung was collapsed, but was quite readily inflated and crepitated throughout. On section it presented an unusually smooth surface of a bright arterial red, and in a few places, especially in lower lobe, there

were small particles of indurated tissue slightly prominent and on section minutely granular, and of a reddish-slate colour.

2. The *left* lung was in a position of almost entire distension, resisting pressure when grasped, and crepitating only along anterior margin of its lower lobe. Powerful inflation distended the lower lobe slowly to almost its full extent, but made no change in size of upper lobe. Over external surface of this lung there were slightly raised grayish patches, seen well by contrast with purple tint of the rest of the surface. On section of the lower lobe numbers of the same indurated nodules were seen as in right lung, but the structure was more granular and pouting on section. The entire tissue was dense, and had a homogeneous appearance as though the vesicles and intervesicular spaces were alike infiltrated with a reddish-gray matter. The upper lobe presented these appearances in even a more marked degree, was very dense, and on section glistening, indistinctly granular, reddish-gray or in places bright red or pinkish. Within a half-inch of the apex there were three vomicæ, one large enough to hold a filbert, the others the size of a pea, containing a little grayish matter and with rough, softened walls. The bronchial tubes in both lungs were much congested and inflamed. The bronchial glands greatly enlarged, some of them two inches long, firm and filled with cheesy matter. All parts of the right lung floated well on water; a slice from lower lobe of left half sank, but any part of the left *upper* lobe sank instantly.

No pericardial effusion. Heart normal.

Abdomen.—The *liver* was found somewhat enlarged, turgid, imperfectly bronzed, and contained large black granules of pigment.

The *spleen* was double normal size, soft and dark, and contained a great deal of pigment.

The *kidneys* were intensely congested. The urine drawn by catheter was highly albuminous, very deficient in chlorides, and deposited vesical epithelium, granular tube casts, and large black pigment granules. There was no lesion in *large* intestine, whilst in the small bowel Peyer's patches were merely slightly prominent, and the lowest patch had a superficial ulcer upon it of size of a small pea.

The *mesenteric glands* were enlarged to the size of a plum-stone, firm, mottled externally, and filled with the same cheesy matter as the bronchial glands. Tubercle corpuscles were clearly detected in mesenteric and bronchial glands and in both lobes of the left lung. Exudation corpuscles were also found in the lung tissue.

Dr. **WM. PEPPER** also read the same evening the following case:—

Remittent Fever; Death one and a half hour after Admission; Pigment in Brain, Liver, and Spleen, &c.; Albuminuria.—Lewis Shellhorn, æt. 30; born in New Jersey; was brought to the Pennsylvania Hospital Sept. 26, 1865, at 4 o'clock P. M., in a moribund condition. He was a sailor, and no history could be obtained beyond the fact that he arrived in Philadelphia Sept. 12, 1865, from the coast of North Carolina, and that he had been taken sick on the trip up, at first with quotidian ague, but before reaching this port the regular chills had ceased and the attack assumed more the type of remittent fever. Since his vessel has been in port he has been boarding almost on the very bank of the Delaware River. On admission his symptoms were these: skin cool and sallow, shrivelled in extremities; pulse barely perceptible; respirations shallow and gasping; unconsciousness, with inability to speak; deglutition very difficult. The belly was retracted; showed no eruption and no marked enlargement of either liver or spleen. It was impossible to get a full drop of blood from the fingers by pricking them, but upon examining the little that could be pressed out, it contained numerous white corpuscles, a deficient number of red corpuscles, which were crenated and running together without forming rouleaux, and several black but rather small pigment masses.

He was roused to swallow quinia sulph. gr. xxxv, and whiskey f℥iv before his death, which occurred at 5.45 P.M. of same day, one hour and three-quarters after admission.

Post-mortem four hours after death.—Spinal column not examined.

Brain not much congested; cortex dark; white substance of a dull grayish colour; no effusion into ventricles nor at base; substance quite firm. Pigment granules were found in every portion of brain, in a few places large and free, but by far the greater portion were in the capillaries, at some places dotting their walls, at others collected into small plugs, filling the calibre of the vessel.

Thoracic viscera healthy, excepting congestion of lower lobes of lungs.

Abdomen.—The *stomach* was congested internally, and the mucous membrane somewhat thickened and in places of a slate colour. The *intestines* were much contracted and contained almost no fecal matter; no glandular lesion in either large or small bowel, Peyer's patches being merely slightly congested.

Spleen was double the normal size, soft and dark. Its pulp contained the usual elements, and in addition a great deal of granular pigment, either free or contained in the granular cells.

The *liver* was slightly enlarged, in line of nipple one and a half inch below ribs, dark and slightly mottled externally; on section presenting a fine dark olive colour. Gall-bladder was full of dark bile, but no gall-stones. The hepatic cells were of good size and shape, without excess of fat; but in every portion of the organ large numbers of pigment granules were found, either free or forming part of the cell-contents.

The *kidneys* were quite small, firm, on section grayish-red. The supra-renal capsules healthy. Pigment was found both in the intertubular capillaries, in the capillaries of the Malpighian tufts, and also free in the form of large black angular granules.

Bladder contained f℥j of cloudy urine, highly albuminious, depositing vesical epithelium, numerous granular tube-casts, and black but rather small pigment masses.

Oct. 11. *Tubercular Menïngitis*—Dr. T. H. Andrews presented the specimen for Dr. WILLIAMS, and read the following history of the case from which it was derived:—

John L. Newman, æt. 35 years; discharged soldier. His illness dates back about eleven months. No known hereditary tendency to tubercle. He had occasional slight hæmoptysis, cough, frequent expectoration, pain in the chest.

At the time of admission, Sept. 11, 1865, he was thin and languid. A decided tendency to diarrhœa was noted, also a disposition to bury the head in the pillow persistently, usually upon the left side. The percussion note under the right clavicle as compared with that upon the left is shorter, of higher pitch, almost dull. The same difference in supra-spinous fossa of scapulæ. Inspiration under right clavicle harsh and accompanied with moist rales, usually fine, sometimes coarse. Expiration prolonged, harsh, at one point almost cavernous. Under left clavicle the inspiration is softer, almost normal, but occasionally combined with fine crackling. Expiration slow and a little jerky. There is evident depression of the right sub-clavicular space, sounds similar to those in front meet the ear placed over the apices posteriorly.

Oct. 15. No marked change in his condition until last Thursday, when a little transient strabismus was noticed; complained of distressing headache, principally frontal, through Thursday, Friday, and Saturday. His bowels, previously loose, became quiet and constipated. He has lost his little remaining animation, and is now quite stupid; lies torpidly, with a typhoid fever expression of countenance; cheeks, too, are flushed and dusky; pulse 84, feeble, not tense; respirations 26; coughs little; articulates distinctly, but intelligence so much clouded that he answers very slowly or not at all, relapsing from the momentary air of attention to the question into his habitual lethargy. There is obvious drooping of the right eyelid with imperfect motion; left pupil a little larger than right; does not appear to see so distinctly with the right eye as with its fellow; moves the balls synchronously but with oscillation; says that hearing in right ear is decidedly duller than in left; hands cool; head, body, and feet warm; tongue moist, with a uniform dirty coat. Yesterday and to-day it was necessary to draw off his urine with the catheter. Pressure and motion of right cervical muscles induce an expression and cry of pain. Urine acid, sp. gr. 1031; chlorides good; no albumen; colour yellow.

Blood.—Red corpuscles good; several black angular grains of pigment; rouleaux formed in masses; no increase of white cells.

Temperature at 8 P.M. Sept. 19th: right axilla 102°.75 with pulse of 108; resp. 36. 8 P. M. Sept. 15, 101°.25. 9 P. M. Oct. 2, 102°.50; pulse 92; resp. 32.

Treatment.—Cod-liver oil, tr. cinchonæ comp., liq. arsenici chloridi gtt. v., with tr. ferri chloridi gtt. xv. t. d.

7th. Stupor increasing. There is inspissated pus in the meatus of right ear.

8th. Semi-comatose, will not answer questions; subsultus about the jaw, and picks the bedclothes; obvious convergent strabismus; pulse 84; respiration 36, often puffing and with low plaintive moan in expiration; bladder still inactive; fresh pus in concha of right ear.

9th. 10 A. M. moribund; pulse very variable in frequency, always feeble, running from 92 to 140; respiration 36, slightly stertorous, intermittent, and entirely diaphragmatic; ribs descend instead of being elevated during inspiration; but little of the pulmonary tissue above the base can be expanded; hand upon the right side of chest detects a fremitus due to the passage of air through the softer matter within; left pupil a little larger than right, both almost fixed. Died at 8½ P. M.

Autopsy twelve hours after death.—Cadaver emaciated; face dusky red; skin elsewhere pale.

Thorax.—Right pleural cavity obliterated except at apex; no adhesions upon the left side, but the hand everywhere detected hard shot-like grains of sub-pleural tubercle.

Lungs very bloody; tubercle active; in left lung disseminated throughout and not softened, except in one or two inconsiderable points in the centre; right lung stuffed with tubercle in various degrees of softening, more advanced above where were formed *anfractuous* cavities with small chambers.

Heart healthy, auricles and ventricles well filled with clots.

Abdomen.—Spleen not enlarged, of good consistence, pale, grayish red.

Kidneys hyperæmic but healthy.

Liver not large; colour mottled yellowish. Supra-renal capsules large, apparently normal.

Intestine in part dark and congested, above pale or greenish-yellow and containing bright yellow feces; irregularly shaped ulcers size of a thumb-nail with puckered edges and not much surrounding congestion, scattered throughout jejunum; in ileum, solitary glands enlarged, ulcerated away, and longitudinal ulcers corresponding to position of Peyer's patches. These had usually the muscular layer for their floor, abrupt edges, and contained partially destroyed granular points. There was occasional sub-peritoneal deposit of tubercle immediately behind the floor of these ulcers. In *large intestine*, glands enlarged; ulcers fewer; mesenteric glands somewhat enlarged.

Cranial Cavity.—Great hyperæmia of meninges, particularly upon the convexity; both veins and arterial branches distended; no marked sub-arachnoid effusion or at base of brain; ventricles filled with fluid, clear, serous, f℥iij in right, f℥v in the left; arachnoid membrane upon the convexity slightly opalescent, but smooth and without lymph; anterior cerebral lobes abnormally adherent, their attached surfaces granular. In the various fissures at the base of the brain fine clear or whitish granulations with thickening of the membrane, a little free lymph. The mamillary eminences were obscured and optic commissure bound down by a thickening, almost colloid or mucous in appearance. This condition particularly marked about the origin of the pneumogastric and spinal accessory nerves.

Microscopical Appearances.—Heart structure healthy. Characteristics of tubercle in lung deposit. *Liver cells* well nucleated, oil globules too abundant. *Spleen*, pulp normal; uriniferous tubules healthy. Granulations at base of brain distinctly tubercular in structure. Pus in ear from abscess in meatus.

Spina Bifida; Fatty Kidney.—Dr. PACKARD related the following case: Kitty R., æt. 4½ years, was the subject of spina bifida, and had never had the use of her lower limbs. I was called to see her September 21, on account of extreme ascitic distension of the abdomen, with anasarca, and puffiness of the face. Her pallor was excessive. Tapping had been proposed at a public institution to which she had been taken, but, as I had attended in the family before, they desired to have me do it. I accordingly drew off about four quarts of clear glairy liquid. Some relief was afforded by this, but the cavity soon filled again. Bedsores had been forming for some time, and her weight, with the distension by the accumulating liquid, greatly aggravated them. Her thighs became gangrenous, and she died worn out, Oct. 7.

Autopsy about twelve hours after death.—All the abdominal organs seemed absolutely healthy except the kidneys, which were about twice their normal size, and fatty. Under the microscope the epithelium in the tubes of the cortical portion seemed degenerated, many minute oil-drops being present here and there.

The spina bifida was just over the upper part of the sacrum, which formed nearly or quite a right angle with the lumbar portion of the spinal column. The posterior part of the sacrum was wanting, a wide cavity being covered in by fibrous membrane, over the anterior (inner) surface of which was spread out the cauda equina. About two inches of fat covered the sac, which was much smaller than would have been supposed from its external appearance. At one point there was a prominence about as large as a walnut, which seemed on section to be constituted by a sort of fibrous growth in the skin.

This deposit of fat and fibrous tissue would have seriously interfered with any operative procedure, had such been attempted; although they did not prevent as perfect fluctuation in the tumour as if the skin and the sac had been in close apposition.

Both thighs were almost immovably flexed on the pelvis, at an obtuse angle, just as they had been during life. It seemed as if there were a double congenital luxation on the dorsum ilii, probably connected with the spinal lesion; but I did not venture to verify the opinion by dissection.

Oct. 25th. Fracture of Base of Skull.—Dr. WM. PEPPER read the following: George McIntosh, æt. 11, a strong, well-developed boy who has been working as shop-boy in a large wholesale store on Market Street, was admitted into the Pennsylvania Hospital at 4½ P. M., Oct. 19, 1865. Half an hour previously, whilst playing on the third floor of the store, he fell through the hatchway. The foreman who carried him in was uncertain what part of his body struck first. On admission he was found to be entirely unconscious, so far as intellection was involved; thus it was impossible to rouse him to reply, to open his eyes, or to make any movement directed, but whenever his head was touched or the surface pricked, he would make quite powerful, semi-voluntary movements with both arms and legs, as if to remove the annoyance. There was no injury to any part below the head, but it appeared that he had fallen head foremost, striking over frontal bone, to the right of the median line, for in this region, extending also over to the left temporal fossa, the scalp was doughy; and although no crepitation could be detected, the absence of resistance to pressure, and the extent of contusion of the external parts indicated serious injury to the skullcap in this region. In addition, there was intense and steadily increasing ecchymosis of right eyelids, but none of the eyeball, although there was marked chemosis, associated with free hemorrhage from both nostrils. No discharge had taken place from either ear. He had occasional vomiting. Pulse 48 in minute, laboured; the respirations 26, snoring. The decubitus was left lateral, with strong tendency to roll over on the face. Deglutition was still possible. His head was shaved, ice applied; a large blister placed on back of neck, and stimulating enemata administered.

7 P. M. Pulse 50, weaker; respiration 30, still snoring (pulse—respiration, ratio 1 to $1\frac{2}{3}$). Increased ecchymosis of the right orbit; deglutition still possible. He is now entirely unconscious, but reflex actions can be aroused in all parts by pricking the skin deeply. Bowel retentive; no discharge of urine; surface cool.

9½ P. M. Respirations irregular, 24 in minute, entirely abdominal; inspiration accompanied by a very loud singultiform crowing sound; expiration forcible and short; pulse feeble, and has run up to 117 in minute; reflex movements are more difficult to arouse; left pupil dilated and insensible; the right one also dilated and almost insensible, none of the muscles of the face could be roused to contraction; bladder completely paralyzed; the bowel still retains the enemata. Soon after this, the pulse ran up to 160, and grew very small; the respirations became jerking, with divided inspirations, and the lungs rapidly clogged with mucus. Death occurred at $10\frac{3}{4}$ P. M., $6\frac{1}{4}$ hours after admission, $6\frac{3}{4}$ after accident.

Post-mortem twelve hours after death.—Discoloration of scalp over the upper part of the frontal bone and anterior part of parietal bone, and extensive apoplexy of occipito-frontalis muscle. There was no fracture of superior part of frontal bone, but it was separated from its articulation with both parietal bones and the squamous portions of both temporal bones, but from the termination of the separation on the right side, a fissured fracture could be traced inwards through the orbital plate of right frontal bone, three lines from its posterior edge to the small wing of the sphenoid bone, and thence downwards forming a radiated comminuted fracture of the posterior wall of the orbit. A large clot of blood, caused by laceration of the anterior meningeal artery, lay upon the right anterior lobe of the brain, compressing it inwards and backwards. There was no laceration of brain tissue, and but a very slight effusion at the base of the brain. Abdominal viscera congested slightly; lungs deeply congested posteriorly; on the left side the pleural cavity was obliterated by old adhesions; heart healthy, containing very little clot; blood less coagulable than in health; bladder distended with very pale urine.

Fracture through Squamous and Petrous Portions of Right Temporal Bone, causing Rupture of Arteria Meningea Media; Effusion of large Clot of Blood.—Dr. WM. PEPPER read the following history: Thomas Hughes, æt. 16, shoemaker by trade, was admitted to surgical ward of the Pennsylvania Hospital at $9\frac{1}{2}$ P. M., Oct. 10, 1865. The only history that could be obtained, was, that he had been engaged in a fight with a number of boys and had received a severe blow from a club or billy over the right temporal bone, about $1\frac{1}{2}$ hour previously. There was no noticeable tumefaction nor discoloration of scalp over right temporal fossa: but a free discharge of bloody serum from the right ear had taken place. On admission, the surface was cool, and he evinced a marked tendency to stupor, although he could be roused to open his eyes partially, and he occasionally screamed violently and raised his hands to his forehead as though suffering acutely. The pupils are slightly sensitive to light, and moderately dilated. The face drawn a little to right side. The pulse was irregular, 50 in minute—heart's action laboured: respirations 27 in minute—shallow and accompanied by hoarse snoring râles anteriorly. Deglutition was almost impossible, and the position of tongue could not be discovered.

Oct. 11, 1865, 8 A. M. He was entirely unconscious. The skin hot and dry, cheeks flushed; capillary circulation sluggish, and although there is no lividity of surface, a dark red colour develops itself within a few seconds over any point of pressure, or along the track made by drawing the finger over the surface (tâche méningitique.) Dorsal decubitus; face slightly drawn toward right side. The right upper eyelid was closed, and the eye divergent with dilated and insensible pupil; the left upper eyelid was drooping, but not entirely closed, the eye more congested than its fellow, but in its proper axis, and the pupil contracted and insensible; the expression of both eyes was vacant and staring. When the right eyeball was touched, the right orbicularis contracted firmly, but on the left side this muscle was entirely paralyzed. The left side of the body also was quiet, the muscles flaccid and almost entirely paralyzed, nor could any reflex actions be aroused. The right side, on the contrary, was in constant motion—the arm and leg being rapidly flexed and extended, and in addition the fingers and toes contracting spasmodically on any object presented to them, and drawing it powerfully toward trunk; reflex movements also were active on this side. The pulse had become regular in rhythm, but is running 145 in the minute, small and very quick; heart-sounds devoid of muscular element; respirations 34 in minute, lungs expanding imperfectly, with abundant dry and moist râles. There has again been a bloody discharge from the right ear through the night, but it has ceased. There is no ecchymosis about right side of head. Neither epistaxis nor bloody discharge from the mouth has been present. Deglutition is now impossible. There is frequent suffocative cough with evident accumulation of mucus, but entire inability to expectorate. Death occurred at $8\frac{1}{2}$ A. M., 12 hours after injury.

Post-mortem six hours after death.—The boy has been of a delicate, scrofulous nature, with slight development of the osseous system. Upon reflecting a flap of the scalp, one or two small ecchymoses were seen on the pericranium over the upper part of squamous portion of the right temporal bone, with a considerable apoplexy of the right temporal muscle. A fissured fracture of the right temporal bone was found running through the tympanum into the mastoid process, and forward and upward through the squamous portion, and internally the fracture extended through the petrous portion of the bone. The arteria meningea media was lacerated, and a very large clot of blood effused *upon* the dura mater over lateral and superior face of anterior and middle lobes, and extending round orbital plate of frontal bone, involving right optic nerve. Under seat of clot there was slight subarachnoid hemorrhage. The brain substance was not much congested; the membranes were congested, but showed no sign of meningitis. No effusion at base or into ventricles. The other viscera were healthy, but much congested, especially the lungs, which were also surrounded by about Oss of serum on either side.

Nov. 8. Gunshot Wound; Ball passing through Thyroid Gland, opening Œsophagus, perforating Vertebral Body, and lodging in Substance of the Spinal Cord; Paraplegia; Inability to Swallow; Death in $25\frac{3}{4}$ hours.—Dr. WM. PEPPER read the following history: Edward Thomas, æt. 22, a returned soldier, was admitted to Surgical Ward of Pennsylvania Hospital, at 11 A. M., Oct. 30, 1865. The preceding evening, at 8 o'clock, whilst in a drunken quarrel with a younger brother over a pistol, the trigger was accidentally pulled at a moment when the barrel pointed towards his throat. The ball, after grazing the chin to the left of the median line, entered about $1\frac{1}{2}$ inch above clavicle, and 1 inch to left of median line of the thyroid cartilage, with a direction from above downwards and from left to right. He fell to the ground immediately, and upon his attempting to rise it was found that he was completely paralyzed below the arms. There was *profuse* hemorrhage from the wound, and, in addition, it was noticed that everything taken into the mouth and swallowed would run out of the opening on the neck. He has been exceedingly restless during the night, and had suffered considerably from dyspnœa.

Upon admission his appearance was peculiar; the eyes wild and restless; features sunken; pupils presented nothing abnormal. There was a superficial wound upon the nose from his fall. The wound of entrance of the ball was small, irregular, and discoloured; and the tissues surrounding it, and around to the back of the neck were œdematous and emphysematous.

On attempting to swallow any fluid, the larger part of it escaped through the opening on the neck. There was marked œdema of the posterior wall of the pharynx, and frequent collections of serum and mucus which he was unable to expectorate, but which, after it had accumulated to a considerable degree, would be expelled to a distance of several feet by a powerful spasmodic action of the diaphragm. The pulse was almost imperceptible, the cardiac impulse nearly extinguished, and the heart sounds changed, the muscular element being almost absent; the valvular sounds very weak, so that the chief thing heard seemed to be a prolonged gentle rush of blood through the cardiac orifices, unattended by murmur. The respirations were irregular—not very rapid—but entirely diaphragmatic, the motions of elevation and expansion being apparently absent. Soon after admission he was obliged to be propped up in a sitting posture, as symptoms of suffocation came on in the recumbent position. On examining more closely the paralysis above referred to, it was found to affect the entire body from the upper edge of the third rib downwards, both as to sensation and motion; from the third to the sixth rib, however, in a circle around the trunk, there was still slight sensibility remaining; thus a needle stuck deeply into the derm within these limits, and moved so as to lacerate it a little, excited a sensation of its presence, but no pain; the reflex movements in this part were also feeble. Below the line of the sixth rib, however, there was not the slightest power either of sensation or motion. The bladder was entirely paralyzed, as were the rectum and its sphincter, for enemata flowed away immediately. The movements of the head, eyes, and tongue were good, and sensation remained unimpaired. The movement of the arms also remained, but their force was less than normal; their sensibility seemed good. Reflex movements could scarcely be roused in the legs at all; the most irritating tickling producing merely a twitch which was scarcely visible. The electro-muscular sensibility was gone in the paralyzed parts, and the electro-muscular contractility much impaired. The temperature was about normal. He complained constantly of pain about head and neck, especially severe about the nucha; this pain he described as being at times of a burning, tingling character. There was a little meteorism, which increased somewhat towards evening. One grain of sulphate of morphia was given by hypodermic injection, and had the effect of somewhat easing the pain. As night came on he became slightly delirious; tore his hair; pushed everything from him, and evinced great restlessness. The respirations became steadily weaker and more irregular; the pulse could not be detected at times; and he died, Oct. 30, 1865, at 9¾ P. M., 25¾ hours after reception of the injury.

The copious hemorrhage, the direction of the ball, the escape of fluids through the wound, and the immediate occurrence of paralysis readily led to the conclusion that the ball had penetrated either the internal jugular vein or thyroid body, had opened the œsophagus, and then entered the spinal cord, cutting the cord about the third dorsal vertebra.

Post-mortem examination, thirteen hours after death.—Brain not examined. Upon reflecting flaps of skin from middle line of the neck, and raising the muscular layers connected with sternum, thyroid cartilage, and hyoid bone (through which the track of the ball could be easily traced), the thyroid gland was exposed. This body was rather larger than is usual at his age, and was perforated by the bullet through its left lobe, close to the thyroid cartilage, and rather above the middle of the gland. The sheath of the carotid artery and accompanying structures was unopened, and the descendens noni nerve intact. Upon raising the gland, the œsophagus was found to have been cut open at the left side, the ball not having fairly entered it, but merely cutting a piece out of the side. There had already been considerable formation of pus, which had burrowed up the sheaths of the muscles of the neck, and had followed the œsophagus down as far as the *diaphragm*. The ball next had entered the body of the first dorsal vertebra on the left side and about its middle; traversed the body and the cartilage below; entered the body of the second dorsal, in its course from above downwards and from left to right; entered the spinal canal at a point half-way down this latter vertebra and to the right of the median line, and buried itself in the substance of the right anterior and middle columns of the cord. There was a small amount of hemorrhage into the sheath of the spinal dura mater, but not sufficient to cause any marked compression. No distinct meningitis had occurred, but there was œdema of the connective tissue outside the spinal cord. The brachial plexuses were apparently uninjured. The œdema and ecchymosis along the anterior surface of the spinal column prevented any dissection of the left sympathetic nerve.

The *lungs* were deeply congested posteriorly, some passive hydrothorax on each side.

The *heart* was flaccid, distended with blood in all its cavities.

The *spleen* was double the normal size, and quite too soft.

The *liver* moderately congested; there was no evidence that he had suffered from malarial fever, although in all probability exposed to its causes in the army.

The *stomach* was distended with gas; contained some little gastric juice with numerous pieces of meat which were quite firm, and scarcely at all digested. The kidneys were intensely congested.

The ball was a round one, about one-fifth inch in diameter, and, despite its long course through the tissues, had not been much flattened.

Cases of injury to the spinal cord, more or less similar to this one, are to be found recorded in many works; but their number can never destroy the interest attaching to them as illustrations of the principles of the pathological physiology of this portion of the nervous system. Among the questions, then, presenting themselves in connection with the case just read, is that of the proportion which the shock of the injury bore in the production of the hemiplegia. There is, perhaps, no idea more strongly suggested in the study of pathological anatomy than the tolerance of the system to many chronic diseases, the extraordinary persistence of function in organs whose entire structure has become changed by gradual morbid action. This statement, so true with regard to the abdominal and thoracic viscera, is sustained in the study of the pathology of the spinal cord by cases where the lesion has amounted to an almost complete solution of continuity, and yet, in which the function of the cord has remained almost intact. The following extraordinary instance is transcribed from Begin:[1]—

"The patient, who was a vigorous man, and addicted to venereal pleasures, was seized, at the age of 34, with stiffness in his arms, then with difficulty in moving them, and finally, after a fall whilst walking, with contraction of these members carried so far, that the hands were stiff, hooked, and so contorted that their palmar surfaces were directed upwards and backwards. The legs notwithstanding preserved their movements in full force; the sensibility of the whole body remained intact, and frequent erections manifested themselves, so that the patient was for a long time able to have sexual intercourse, the desire for which continued active until a short time before death. After long sufferings the patient died. At the autopsy, a large quantity of serous fluid was found in the spinal arachnoid cavity, and for the extent of six or seven inches comprising the lower two-thirds of the cervical portion and the upper third of the dorsal portion; the spinal cord was so soft that the canal of the dura mater seemed really to be distended by a fluid, which fell and rose according to the angle at which the corpse was held. . . . . On opening the dura mater, this portion of the cord showed an elongated cavity filled with a grayish-red fluid, and traversed by a number of delicate bloodvessels. The cords from which the roots of corresponding spinal nerves take their origin could scarcely be distinguished in the anterior part of this disorganized portion; and on the left side the spinal cord seemed completely destroyed for an inch and a half. . . . . . Examined on its anterior surface, the cord seemed less altered; and the diffluent condition of the nerve matter did not involve the external layer. . . . . This disorganization commenced abruptly below origin of fourth cervical nerves, and extended close to the fourth pair of dorsal nerves. It is worthy of remark that here a layer of medullary matter about two lines thick, and probably altered in structure, was sufficient to keep up communication between superior and inferior extremities of the cord in so perfect a manner, that not only did the legs still obey the will, but the genital organs could be powerfully excited and transmit vivid sensations of pleasure to the brain."

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[1] Traité de Physiologie Pathologique, i. 235.

In recent injuries, however, so far from any such tolerance being established, a contrary state of things is generally noticed; for, although cases occasionally occur where the actual lesion fully explains the paralysis following, as in the case reported by Gross,[1] where the ball from behind entered between the last cervical and first dorsal vertebræ, penetrating and pulpefying the cord, and cutting it in two by projecting across it a fragment from the injured bones, the ball itself being found loose in the vertebral canal. Here the symptoms were, as might be expected, power of motion of arms remaining, but complete paralysis of body and legs, with loss of sensation from near the top of the sternum to the soles of the feet. The pulse was slow, and respiration heavy and laborious. The bowels were costive; and the bladder had to be relieved by catheter (life was prolonged in this case three and a half days). But it generally happens that fibres of the cord which do not suffer actual physical disorganization, lose their power of transmitting impressions, whether from compression by the effused blood, or from the shock of the injury. In the present case the ball entered the dura mater to the right of the median line, and buried itself in the right anterior and lateral column of the cord, producing but little hemorrhage into the canal of the dura mater. The amount of compression exercised upon the rest of the cord was not apparently such as to entirely occlude it, nor was there much pulpefying of the left columns of the cord, and yet from the first instant there was complete paralysis of motion and sensation in the trunk and legs, together with a marked decrease in activity of reflex actions in the part paralyzed.

Is it not possible in those cases where the system reacts, as in primary attacks of apoplexy, that the slow reappearance of power in parts at first completely paralyzed, may be due to the gradual subsidence of the shock which the adjacent nervous tissue has received.

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[1] System of Surgery, vol. ii. p. 306.

A second point of some interest in connection with this case is the explanation of the slight sensibility and power of movement which remained in the parts situated between the line of fracture, and the upper part of the sixth rib. Bearing in mind that the brachial plexus was uninjured, this absence of paralysis may be traced to three sources: "1st, the intercostal branch of the anterior division of the first dorsal nerve, nearly all of which enters into the brachial plexus; 2d, the anterior thoracic nerves, the external or superficial arising from the outer cord of the brachial plexus (formed from fifth and seventh cervical), and distributed to the under surface of the pectoralis major, while the internal or deep branch arises from the inner cord of the brachial plexus (formed from the eighth cervical and first dorsal nerves), and is also distributed to under surface of pectoralis major and minor muscles; and 3d, the middle or clavicular branch of the cervical plexus (from the third and fourth cervical nerves), which crosses the clavicle and supplies integument over pectoral and deltoid muscles, communicating with cutaneous branches of upper intercostal nerves.

From the point at which the ball struck the left side of the body of the vertebra, it is not probable that any filaments of the left sympathetic were cut, so that the character of the heart sounds, the paralysis of the stomach as shown by the undigested fragments of meat, the paralysis of the bladder and of the rectum afford a complete demonstration of the important motor action of the spinal filaments of the sympathetic nerve.

As regards the prolongation of life after injuries of the spinal cord, perhaps the most important question is as to the implication of the phrenic nerves. Where the nerves are completely paralyzed, or in other words, when the compression or laceration is seated at or above the third cervical nerve, life is not prolonged much beyond twenty-four hours. But when these nerves are not involved in the injury, life may be prolonged to a much greater extent; so that perhaps the average duration of life after injuries involving the entire cord just below the origin of the brachial plexus, may be stated as from eighteen to twenty-four days. In the present case, the inability of the patient to receive stimulants, the free hemorrhage from the thyroid gland, the great œdema of the pharynx and adjacent parts, afford a full explanation of his death in so short a period as twenty-four hours.

Nov. 14th. Medullary Cancer.—Dr. S. W. Mitchell, on behalf of Dr. PEALE, of Holmesburg, Pa., presented the specimen, and read the following notes of the case from which it was derived.

Mrs. McDaniels, æt. 47, first felt a soreness at the junction of upper with middle third of the rectus femoris muscle of each thigh. This soreness soon got well on the right leg, but on the left continued, and gradually became a small lump (as she described it), forming a tumour the size of the fist by the expiration of about three months, which was August 20, 1864, at which time she was obliged to remain in bed, owing to the pain in the limb, and she has continued there up to this date, Feb. 2, 1865. The tumour is now situated over most of the upper and middle thirds of the anterior portion of the thigh, covering a space as nearly as can be estimated by external examination, of about 9 inches long, beginning 1½ inch below Poupart's ligament, and apparently about 5 inches wide, and projecting from the bone 3½ inches.

There is an obscure sensation of fluctuation over a surface about 3½ inches by 4 inches at the apex of the mass. The skin has a dark-red appearance over a space 1½ inch in diameter near the centre of the mass.

Enlarged vessels traverse the entire length of the tumour before palpation. No pulsation could be discovered at any point, but auscultation discovered a slight but decided *bruit de soufflet* over central part.

On Jan. 18th, I punctured the mass with a bistoury, and explored the cavity with a probe. The cavity appeared to be the size of a small orange, and filled with fluid. The fluid which escaped through the puncture was very thin and bright red, much like poor arterial blood. It came in a continuous stream. In the cavity there were projections, apparently either cartilaginous or fibrous. Pains in the tumour were paroxysmal, very intense, but not frequent, described as an aching soreness. Mrs. McDaniels had been a well-developed, strong, hard-working woman. Her left leg, however, was shortened by what appeared to have been morbus coxarius occurring in childhood. For many months previous to her present sickness she had nursed her mother, a paralytic, and very heavy woman, requiring a great deal of lifting, which she had done alone. I inferred from this circumstance, and from the height of the bed on which her mother had lain, that the edge of the bedstead rail, against which she had braced her thighs, had caused the bruised places on them. From the time she first felt the soreness for about four months she was attended by a homœopath, and for a few months by a horse doctor, who promised to cure her by poulticing the tumour with flaxseed meal.

After this, on the 17th of January, she sent for me. I found the tumour as described above.

Her general health was very poor; she had diarrhœa, night-sweats, and cough; was scarcely able to bear lifting out of bed to the chair.

Under careful treatment, diarrhœa, night-sweats, and cough ceased, and strength improved. She continued better for about two months; after which she became dropsical from her feet to her chin, and died May 10th, with entire inability to swallow either solid or liquid food, in consequence of the pressure of the effusion upon œsophagus.

The *post-mortem* examination of the tumour showed the cavity to be filled with a clear amber-coloured fluid of the consistence of coal oil. The extremities of the mass were cartilaginous and osseous, and continuous with the rectus femoris muscle. The vastus externus and internus curved around the mass, evidently having been pushed aside by it while growing. The periosteum of the femur beneath the tumour was intact, but there were four or five small round prominences beneath, of the size of pin heads, covering a space about three-quarters of an inch in diameter. The femoral artery and vein were pushed aside, and lay beneath the tumour, nearly under the centre of the cavity. The course of the profunda artery could not be traced, it being so matted with the other structures, but I thought it supplied the tumour with its nourishment.

Nov. 22d. Report of Examination of Tumour.—By Dr. WM. PEPPER.

In presenting to the Society this report upon the tumour referred to me at the last meeting, I think it but fair to say that, excepting as regards its general characters and the general considerations springing from them, it is not worthy of being held to be conclusive. The changes produced in the relative consistence, in the colour, in the amount of granular débris, in the size of the cells and the appearance of their contents, are so great and so uncertain that, so far as the microscopic examination is concerned, I offer the results with great diffidence.

The tumour which, as you remember, was seated on the anterior surface of the left thigh, measures in the circumference of its longitudinal diameter 16½ inches, and in its circumference transversely 14½ inches; its weight after prolonged maceration is 2 lbs. 4 oz. (Avoir.). It is essentially composed of two parts, a capsule, and a number of lobules of varying size and consistency. In the base of the tumour, running in the direction of its long diameter, is a layer of muscular tissue, the fibres of which are granular, broken, and fatty; there is also an excess of fibrous tissue, and considerable interstitial fatty degeneration. The capsule, which seems to rise from the layers of fascia and sheaths of the muscles, is very firm, and in places fully one-third of an inch in thickness; and along the base there are numerous points of ossification imbedded in its walls. Its structure is not homogeneous, but shreddy; the white fibrous bands leaving fine areolæ which appear filled with a more grayish matter. Under microscope, it consists of interlacing bands of fibrous tissue, with oil globules scattered through them, and especially in neighbourhood of the nodules of bone, inclosing numbers of cells; aggregated in small collections, small, mostly singly nucleated. The tumour which it incloses is lobulated, the lobes varying in size from a cherry to one which composes almost half the entire mass. They are connected with each other by delicate layers of areolar tissue, and have their shape modified by natural pressure. They vary much also in consistence; the hardest cutting almost like cartilage, and presenting a smooth, firm, and slightly granular section, whereas the softest are very doughy, and their structure loose and broken, like a soft steatoma. Under microscope the softer portions contained little else than the granular débris of cells mixed with a great proportion of oil globules and granular fat. Other portions, rather more consistent, contained some fibrous structure, altered cells and nuclei, much fat and granular débris; and it was only in the hardest lobules that it was possible to obtain a section at all capable of demonstrating the structure. A section of one of these showed a moderate amount of fibrous tissue, rarely forming distinct areolæ, with cells and free nuclei clustered together in a delicate blastema. The cells varied much in size; none of them, however, being notably large; and in the number of their nuclei, some containing a single one; others, three, four, or even more; the nuclei as a rule were large in proportion to the containing cell. Many of the cells were quite delicate, and generally both cell and nucleus were rendered more transparent by action of acetic acid. There was a quantity of oil in these portions also, although very much less than in the softer lobules.

The method which proved most successful for displaying these elements was to soak the section in water; treat it with acetic acid; then with ether; and, subsequently, add solution of aniline red to render the nuclei more distinct.

Lithotomy.—Dr. JOHN ASHHURST, Jr., M. D., read the following paper: Charles Hinkle, a boy of five years of age, was brought to the Episcopal Hospital on May 5th, 1865, suffering from the usual symptoms of vesical calculus. He was exceedingly thin, weak, and harassed by a severe attack of whooping-cough, which, however, it was stated by those who brought him had already begun to decline. He suffered besides from aggravated prolapse of the rectum, the bowel coming down not only when he went to stool, but during each paroxysm of coughing.

The introduction of a sound revealed the presence of a calculus of considerable size, and which from the account given by his friends must have been several years in forming.

An examination of his urine, which was entirely free from blood and pus, showed the presence of oxalate of lime in large quantity.

It was evident that the child was gradually sinking under the complicated evils of his condition, and it was therefore decided in consultation not to postpone operative interference with any expectation of amelioration in his physical condition, which was however confessedly far from satisfactory.

Accordingly on May 10th, the patient being thoroughly etherized and secured by bandages in the usual position, his bladder having been injected with a few ounces of tepid water, I performed the ordinary lateral operation, the staff being held firmly against the pubic arch by my colleague Dr. Forbes.

The knife employed was a common scalpel of small size, which sufficed for all the steps of the operation, the wound being then dilated with the finger so as to permit the introduction of the forceps. The stone was thus extracted without any difficulty, and was found to weigh 159 grains, a minute portion having been chipped off by the forceps, rendering the approximate weight of the whole about $2\frac{3}{4}$ drachms.

Not more than a tablespoonful of blood was lost during the operation, and the patient was therefore at once placed in bed, the bladder being merely washed out with a syringeful of warm water.

The patient did very well after the operation for about two weeks, when an abscess formed immediately beneath and communicating with the umbilicus, opening spontaneously, and discharging pus mingled with a fluid of a decidedly urinous odour. In spite of this, however, the patient rapidly improved under good diet, careful nursing, and the administration of nitro-muriatic acid (the perineal wound healing firmly though slowly), and at the time of his leaving the hospital, he was very much better in every respect than before the operation, and complained only of slight cough, and occasional tenderness of the skin around the umbilicus.

He was discharged September 22d, 1865, having been in the hospital 140 days.

Nothing further was heard from this patient until October 28th, 1865, when the person who had charge of him came to the hospital stating that he had died that morning about 3 A. M., and requesting the resident surgeon to furnish a certificate. This of course could not be done without an autopsy, which was accordingly made the next day by Drs. Bodine and Watson, resident surgeons to the hospital, who have furnished the notes of the examination.

Autopsy twenty-nine hours after death.—Rigor mortis very well marked. The cadaver greatly emaciated. Decomposition had already begun. The head was not examined. In the thorax old pleuritic adhesions were found on both sides, and both lungs contained numerous tuberculous deposits, which had advanced to the stage of softening in the lower part of the upper lobe of the left lung. The heart appeared healthy. The abdomen presented some peritoneal adhesions around the umbilicus, and the urachus, which was patulous, communicated with the sub-umbilical abscess. The bladder was much contracted and thickened, and its lining coat roughened and darkly congested. The wound of lithotomy seemed to have reopened at one point.

Death apparently resulted from the tuberculous disease, which probably had remained latent from the date of an attack of sickness which he had experienced when between one and two years old, until excited to fatal activity by the debility produced by the combination of whooping-cough, and the irritation due to the presence of calculus.

I have subjoined a table of five cases of vesical calculus, being as far as can be ascertained, the entire number treated in the Episcopal Hospital up to this time.

A Tabular View of Five Cases of Vesical Calculus Treated in the Episcopal Hospital.

No.	Name.	Age	Sex.	Nativity.	Conjugal state.	Occupation.	Date of entrance.
1	Samuel Patton	6	Male	U. S.	Single	. . . . .	Nov. 6, 1860
2	Henry P. O'Brien	11	"	"	"	Schoolboy	May 31, 1864
3	John Donaldson	70	"	Ireland	Married	Weaver	July 8, 1864
4	Charles Hinkle	6	"	U. S.	Single	. . . . .	May 5, 1865
5	Mary Hayes	10	Female	"	"	. . . . .	May 17, 1865

No.	Name.	Result.	Date of discharge.	Days in hospital.	Nature of operation.	Remarks.
1	Samuel Patton	Recovery	Jan. 12, 1861	67	Lateral lithotomy	
2	Henry P. O'Brien	Death	June 21, 1864	21	" "	Died from erysipelas.
3	John Donaldson	Death	July 20, 1864	12	" "	
4	Charles Hinkle	Recovery	Sept. 22, 1865	140	" "	Died in 25 weeks from phthisis.
5	Mary Hayes	Recovery	Oct. 16, 1865	152	Rapid urethral dilatation.	

Polypi of the Vocal Chords.—Dr. S. W. Mitchell exhibited the specimen for Dr. CHARLES M. ELLIS, and read the following history of the case from which it was derived :—

On the 29th of October a mulatto child, three years of age, suffering with great difficulty of breathing, was brought to me. The following history was elicited from its mother :—

In February last the child's voice became hoarse, the hoarseness gradually increasing until the voice was entirely lost. A troublesome cough began at the same time. No attention was paid to these symptoms, as the child continued in excellent health ; in fact, it was never in as good health as during the summer. Early in September occasional paroxysms of dyspnœa supervened, and so rapidly increased in frequency that, by the last of the month, there was no intermission of the violent efforts of the child to perform the act of respiration. The dyspnœa was temporarily much relieved by the expulsion of "a piece of flesh stained with blood," after a severe fit of coughing. Notwithstanding this continued embarrassment of the respiratory function, the child's general health did not materially depreciate. During this month it was placed under the care of an "Indian doctor."

When I first saw the child its respirations were above 40 per minute, and every muscle was taxed to its utmost in expanding the cavity of the chest. The sternum was forced out an inch and a half above the level of the chest, but was readily reduced to its natural position and retained there by pressure of the hand, without increasing the child's sufferings. Every respiration was attended by a shrill croupal sound. The pulse was almost natural in frequency, volume, and force. There was not, nor had there been at any time, difficulty in swallowing.

It was evident that the difficulty of respiration was produced by the existence of an obstruction in the larynx, but the most careful inquiry did not disclose any history of the introduction of a foreign substance into the windpipe. The nature of the child's sufferings was explained to the parents, who finally acquiesced to my proposition to open the windpipe. The child, in the meantime, failed very rapidly, and died on the sixth of November, a moment after it was placed on the table preparatory to the operation for opening the larynx and trachea. On examination the laryngeal passage was discovered to be constricted to a remarkable degree by the pressure of a polypus projecting from each vocal chord.

The neck of the growth of each side is of equal length laterally with the chord. They extend downwards about half an inch. In the fresh condition a knitting-needle cannot be passed by them into the trachea without displacing the growths. There was no injection or tumefaction of the lining membrane of the larynx or trachea.

The mother, at the child's birth, was suffering from secondary syphilitic symptoms, and the child in its first year had external evidences of an inherited taint.[1]

Dec. 13. Suppurative Meningitis following a Blow upon the Nose, which produced a Comminuted Fracture of the Nasal Bones, the Turbinated Bones, and the Vomer.—Dr. WM. PEPPER exhibited the specimen, and read the following history of the case from which it was derived.—

William B. Scaife, a British seaman, but by birth a Norwegian, æt. 40 years, was admitted to surgical ward of Pennsylvania Hospital, Dec. 1, 1865, at 2 P. M. The day previously, in the afternoon, he was struck across the face, on a line with the bridge of the nose, by the boom of a vessel. There had been considerable epistaxis before admission, and the nostrils were filled with a hard dry clot. There was marked ecchymosis and tumefaction of the soft parts about eyes and nose, and it was easy to produce crepitation in the nasal bones. There was, however, neither ocular ecchymosis nor any discharge from the ears. Soon after admission, his face was dressed with lead-water and laudanum, and he was put to bed—although he seemed as well as usual, and complained of no particular pain or uneasiness. He kept quietly in bed through the afternoon, and no symptom attracted any attention, until about 7 P. M., when he complained of nausea and soon vomited the supper he had eaten shortly before. After vomiting he complained of intense headache (in the back of the head especially, according to the statement of the patient who lay next to him), and within thirty minutes from first complaint of nausea, he was seized with a slight but general convulsion. Immediately after this, he presented the following symptoms: Complete unconsciousness—it being impossible to attract his attention or to gain any sign of recognition; general spasmodic movements of all the extremities, with strong tendency to contraction of hands and feet; an aspect of wild delirium, with frequent efforts to get out of bed; complete loss of power of co-ordinating muscular movements, so that if he gained his feet, he would instantly fall; and frequent piercing shrill cries. The face was flushed, the pupils moderately contracted and not entirely insensible. The lower part of the face was much distorted, the mouth being drawn into a marked "sardonic grin." The surface was hot and dry. The pulse was about 110 per minute, quite hard and full: the respirations were irregular, shallow, and frequent. Reflex movements could be aroused in all parts, though less actively than normal.

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[1] See Report of Committee, read Jan. 10, 1866, in reference to the influence of syphilis in causing morbid growths of larynx.

There was no suspicion of the patient being an epileptic, and the breath was entirely free from alcoholic odour.

The patient was strapped down in bed, ice-water applied to his head, a large blister put on at back of his neck, and a turpentine enema administered.

At 9 P. M., the unconsciousness and spasmodic movements continuing, although his cries were much less frequent, he was bled to about f℥xxij from the right arm—the cloths wrung out in ice-water were kept up through the night.

The blood, which was drawn quickly, formed a large clot, quite firm, without marked buffy coat.

The following morning the symptoms had changed considerably; there were still spasmodic movements of the extremities, with carpo-pedal contractions, and the *risus sardonicus* persisted; but the face was livid, the pupils dilated and insensible, the left eyeball rolled inwards and upwards, the extremities cold, and reflex movements very feeble. The pulse was weak and frequent, though not small, and the respirations frequent and laboured. Urine voided involuntarily.

No further treatment was adopted, deglutition being impossible and the rectum no longer being retentive. The symptoms remained much the same through the day, and death occurred at 9 P. M., about fifty-two hours from reception of the injury, and but fourteen hours from development of the first symptom of cerebral lesion.

Post-mortem twelve hours after death.—Head alone examined. There was no wound externally communicating with fracture of nasal bones, but upon dissecting off the soft parts the fracture was found to involve all the small bones of the nose, the nasal border of the superior maxillary bone on either side, the upper turbinated bones, and the vomer—the comminution of these latter bones extending up to the cribriform plate of the ethmoid bone. Upon removing the calvaria, the dura mater and external layer of arachnoid were intensely congested; the inner layer of arachnoid was opaque, and over the entire convexity of the brain was spread a layer of thick creamy pus, occupying the subarachnoid space. This was especially marked over anterior and middle lobes of brain, but extended round the fissure of Sylvius on each side (but more so on the left), and reached posteriorly over the posterior lobes, and, to a much less extent, over posterior surface of cerebellum and medulla oblongata. There were about f℥ij turbid serum effused around base. The ventricles did not contain any abnormal amount of fluid.

Dec. 27. Abscess of the Spleen.—Dr. GEORGE PEPPER exhibited the specimen, and stated that the case had occurred in the practice of Drs. Fricke and Levick, who kindly allowed it to be presented to the Society.

The patient was a German of about 45 years of age, stout and well formed, and in the enjoyment of excellent health until his last illness; he was accustomed to consume a considerable quantity of lager beer daily, but was not of intemperate habits. About two months previous to his death he visited the country, but was soon obliged to return to his home on account of a general feeling of malaise accompanied with more or less constant chilliness. He then experienced for the first time a severe pain, of apparently rheumatic character, in the right knee, accompanied by considerable heat and swelling of that joint. For this he was treated by his wife with some purgative nostrum during thirteen days, being violently purged and puked by the remedy. At this stage of the disease Dr. Fricke first saw him; there was still considerable pain in the joint, but the swelling and redness had disappeared. He was put upon the use of the iodide of potassium and morphia, and as he was much prostrated, stimuli and a nutritious diet. Under this treatment the pain disappeared, but the case became complicated by the appearance of decided chills, quotidian in type; although no miasmatic origin could be detected, sulphate of quinia was ordered in antiperiodic doses, combined with opium and blue mass. This had no controlling effect whatever. His condition becoming more and more dangerous, Dr. Levick was called in. The patient presented no lesion, so far as could be determined, of the respiratory, circulatory, or digestive systems; the limits of the liver, as marked out by percussion, were rather increased; the patient complained of a dull pain felt in the left hypochondrium, but percussion revealed no increase in the bulk of the spleen; he could lie at pleasure on either side, and pressure seemed to aggravate it but very slightly. The chills assumed the double quotidian type, and the quinia was increased to gr. xx, xxx, and xl on three successive days, combined with tinct. ferri chlor.; stimuli and nutritious diet. The chills were very violent in character, and followed by profuse and exhausting sweats. Towards the close of his illness his intelligence, which had hitherto remained perfect, became impaired, and this condition gradually deepened until two or three days before death there was almost complete coma. The surface of the body also became covered with petechia and vibices, and death took place quietly.

Post-mortem examination, at which I was kindly invited to assist, revealed the following:—

The body large, well formed, and fat; the cadaveric rigidity marked; petechia much faded.

Brain pale; substance normal, with the exception of the left middle lobe of the cerebrum, which was much softened; no effusion; meninges healthy.

Heart pale yellowish colour; much loaded with fat; texture friable; right side dilated; valves normal.

Lungs pale, crepitant throughout, a few calcareous nodules in posterior part of the right lung, it being also bound down by a few old adhesions.

Liver rather soft, of a grayish-yellow colour, with a faint greenish tinge; the microscopic characters were those of advanced fatty degeneration, with a slight increase of the fibrous structure.

The gall-bladder contained about f℥iss of healthy looking bile.

Kidneys pale, soft, cortical substance rather diminished, the secreting cells were diminished in number and contained granular fat.

Spleen slightly enlarged, splenic pulp of rather soft consistence and of a reddish-brown colour. On the left inferior extremity of the organ, immediately beneath the capsule, was found an excavation containing about f℥ss of fluid of a reddish-brown colour, resembling ichorous matter; the walls of this cavity were about two lines in thickness, of firmer consistence than the remainder of the organ, and of a yellow colour, resembling concrete pus or cheesy tubercle.

The *microscopic characters* of the walls were shrivelled granular cells, cells with single nuclei, fat granules and globules. The fluid in the cavity consisted of shrivelled granular cells, cells with single nuclei, blood corpuscles, fibres apparently the broken-down trabecula of the spleen, fibrous cells, a few masses of angular opaque reddish-black pigment, fibrinous flakes.

Splenic pulp of normal character. Blood, dark and fluid.

Dr. BRINTON stated that in military practice he had met with many cases of metastatic abscesses of the spleen, liver, and lungs, occurring after inflammation of the knee-joint, the result of gunshot injuries; and also after gunshot injuries of the bones, especially of the femur; and after osteomyelitis following amputation. He used the expression "metastatic abscesses," although he doubted whether the term abscess was at all times strictly applicable to the lesions in question. In many of these instances of metastatic deposit he had been enabled to make careful dissections of the parts involved, and as far as his experience went, it was rare to find that these so-called abscesses in reality contained pus. The external appearances of the diseased parts were those indicative of purulent deposit, but microscopically examined, the contents of the cavities proved to be a disintegrated and disorganized mass, consisting of oil globules and shrivelled granular cells and fibres. In the great majority of cases no pus cells or globules could be discovered, and the deposits appeared to present gangrenous rather than purulent characteristics.

Dr. Brinton stated that in most of the secondary or metastatic deposits in the lungs which he had examined, thrombi were present in the larger veins and particularly in the femoral and iliac veins. In these cases the deposits in the lungs were of a cheesy consistence, and were devoid of pus corpuscles. Dr. Brinton also remarked that he had not in any instance succeeded in convincing himself of the existence of the detached masses of emboli alluded to by Professor Virchow in his lectures on Thrombus. In metastatic deposits in the lungs of the most circumscribed character, and in every stage of development, he had again and again sought for the small clots in the vessels described by Virchow, but he had never succeeded in detecting them. While he was far from denying that such clots might be detached from a larger and central clot, and might be carried by the circulation to a remote organ, and there lodge, and thus act as a predisposing cause of metastatic deposit, he could only say that the most careful dissection on his part had failed to reveal this fact in any of the many specimens of secondary deposits which had come under his notice.

Dr. Hutchinson remarked that he had seen such a condition of the spleen as in the specimen presented by Dr. George Pepper, associated with some form of disease of the heart and dependent upon an embolus which had lodged in one of the branches of the splenic artery. In this case he understood the arteries had not been examined, but the heart was found to contain an old clot. The matter contained in these so-called abscesses did not ordinarily present the microscopic appearances of pus.

REVIEWS.

ART. XVII.—*Hypodermic Injections in the Treatment of Disease.*

1. *Hypodermic Injections in the Treatment of Neuralgia, Rheumatism, Gout, and other Diseases.* By ANTOINE RUPPANER, M. D., Fellow of the Massachusetts Medical Society. pp. 160. Boston, 1865.
2. *On the Speedy Relief of Pain and other Nervous Affections, by means of the Hypodermic Method.* By CHARLES HUNTER, Surgeon to the Royal Pimlico Dispensary, etc. etc. pp. 64. London: John Churchill & Sons, 1865.
3. *Die Hypodermatischen Injectionen nach clinischen Erfahrungen,* von Dr. E. LORENT in Bremen. pp. 48. Leipzig, 1865.
   Clinical Experience with Hypodermic Injections, by Dr. E. LORENT, of Bremen.
4. *Die Hypodermatische Injection der Arzneimittel. Nach physiologischen Versuchen und klinischen Erfahrungen bearbeitet,* von Dr. ALBERT EULENBERG, Privat-Docent und Assistant Arzt der chirurgischen Universitäts-Klinik in Greifswald. Eine von der Hufelandischen medicinisch-chirurgischen Gesellschaft gekrönte Preisschrift. Mit einer lithographirten Tafel. pp. 218. Berlin, 1865.
   The Hypodermic Injection of Medicines, treated according to Physiological Experiments and Clinical Experience, by Dr. ALBERT EULENBERG, Private Teacher and Assistant Physician of the Surgical Clinic of the University of Greifswald. A Prize Essay of the Hufeland Medico-Chirurgical Society.

THERE can be no question that the administration of medicines by injection into the subcutaneous cellular tissue is a most important addition to our therapeutic resources. Avoiding the pain which attends the endermic method, and securing a more direct entrance to the economy than the digestive organs afford, it insures certainty of effect to our remedies, and so obviates in an important particular one of the uncertainties of our art. As a means of relieving pain it rivals even the inhalation chloroform in certainty and rapidity of action, surpasses it in permanence of effect, while it is free from any objections which might be made in regard to danger.

The brief space of time within which it has established itself in the profession is a proof of its value, as it is, too, a complete refutation of the oft-repeated slander, generally made by the adherents of some form of quackery which has not succeeded in establishing any merit, that we are slow to adopt improvements in our profession, and indeed, set ourselves obstinately against progress. First used by Dr. Wood, of Edinburgh, and made known by him in 1855, it was largely tested,'and the results published in 1859, by Dr. Hunter, of London, while Behier, Courty, and Follin, of France, and Oppolzer and Scanzoni, of Germany, are chief among those who in that and the succeeding year spread intelligence of its merits. In this country Dr. Ruppaner was the first writer upon the subject (May, 1860), until now we believe the knowledge of it is very general and the practice rapidly extending among us, while its value is nowhere denied, certainly by no one who has given it a fair trial.

The works whose titles stand at the head of this article are among the few which have yet been published upon the subject. That of Dr. Ruppaner was, we believe, the first to appear in our language, certainly the only one which has appeared in this country, and therefore of additional interest. It is a condensed but well-written treatise, presenting a sketch of the history of the introduction of hypodermic medication, describing the necessary instrument and the operation, indicating the class of cases to which it is adapted, and the remedies best administered in this way; containing everything in fact necessary to instruct and guide a practical physician in the matter. It is especially marked by, and valuable for, its detail of cases treated by the author himself, of which he gives sixty at greater or less length.

Dr. Hunter's work is mostly made up of an assemblage of papers written by him for medical societies or journals. It therefore lacks that methodical arrangement and finish which belong to a treatise. While it contains much of value, and being the production of an early labourer in this field of research, cannot fail to be of great interest, it is marred, we think, by a tone of injured *amour propre*, arising from a contention with Dr. Wood, of Edinburgh, as to priority in use of hypodermic injections for general diseases and the necessity of localizing the injection in cases where they are used for relief of pain. Much space of his little work is thus occupied which we cannot but think would have been better filled with details and examples from the large amount of experience he has undoubtedly had with this method of treatment.

The work of Dr. Lorent is a brief and modest contribution to the subject, and, as its title indicates, essentially clinical in character. Evidently a practical man, and a man of practice, he has investigated the subject to discover what aid he could derive from it in his daily encounters with disease. His experience seems to have been large, numerous cases are given in detail, and his relation of them bears the impress of truthfulness as does his whole work, and exhibits as well moderation of expression and unbiassed judgment.

Dr. Eulenberg's prize essay is a work of wider scope and higher aim. It may be said to cover the whole ground in every particular up to the time it was published, an appendix being added while it was in press. With true German comprehensiveness and minuteness of detail, it aims at exhausting the subject. Had Tubal Cain, "the first worker in brass and iron," ever made an instrument for hypodermic injection, we should undoubtedly find a description of it here. Its bibliography includes every work published upon the subject, and every magazine article, not excepting those of our own country, as we find mentioned the *American Journal of the Medical Sciences*, the *Transactions of the American Medical Association*, and Prof. Goldsmith's name, in connection with the injection of bromine. It gives in detail all that is known of the action of every medicine thus administered, of the rarer alkaloids as nicotin, ergotin, conia, and woorara, and hydrocyanic acid; every disease thus treated, or proposed to be treated, comes under notice, even to stuttering, prolapsus of the rectum, and extra-uterine pregnancy! Further, in his chapter on "the forensic relations of subcutaneous injections," the author writes in view of a future, which may we never see! when there will be hypodermic

Palmers, and Pritchards, and Martha Grinders! But it must not be supposed that the work is a mere compilation of other men's observations and opinions; the author has worked faithfully in person upon his subject, and the "physiological experiments and clinical experience" of the title-page are found throughout the work; he has studied the subject both theoretically and practically, and his work contains his own observations faithfully detailed, and his conclusions clearly stated, as well as the results obtained by other labourers in the field.

We proceed first to inquire, what are the inconveniences or dangers attending this mode of medication, and how are they to be avoided? It is limited, certainly, in the range of its applicability; limited by the form and dose of the medicine, and perhaps adapted to the treatment of but a small number of diseases; facts which do not conflict with the high praise bestowed upon it. The pain attending the puncture with the syringe is insignificant, yet dread of even so small an amount of "cold steel" may prevent its use in some very nervous persons. No local after-effect of any consequence has been anywhere recorded; and the one objection of note arises from the much smaller quantity of a medicine necessary to produce an effect when used in this manner than when introduced into the stomach. So far as the preparations of opium are concerned, this objection is easily met; care and accuracy in regulating the dose obviate all danger from this source, in other words, it needs but to be known to be avoided. We have heard several rumors of severe symptoms and even sudden death having followed subcutaneous injection of morphia, the presumption being that a vein had been punctured and the medicinal solution poured directly into the current of the circulation. Introduced in this way, far more violent effects result than when it is simply deposited in the cellular tissue. The only well-authenticated case of alarming symptoms produced in this way is that of Prof. Nussbaum, of Munich, which has been generally copied into the medical journals.[1] To this we may say, first, it was the only instance out of a great number of injections; "he had injected morphia under his own skin more than two thousand times!" So Graefe says he has injected the temporal region "hundreds of times," Dr. Wood made over one hundred injections in one patient, and Eulenberg has made sometimes forty or fifty, and in one case four hundred, without meeting with a single instance of unpleasant result. Second, the dose was very large for the mode of administration, two grains of acetate of morphia, an amount which could only be reached by long-continued use of the medicine. It may be well to mention here the mode of avoiding danger proposed by Prof. Nussbaum *apropos* of this case; it is, to inject *very slowly;* the violent effects being almost immediate in their appearance the injection can be stopped in time to prevent danger. We suggest also the withdrawal of the point of the syringe for a short distance before pushing down the piston; the elasticity of the tissues, it seems to us, would close any puncture of a vein which might have been made, and thus prevent ingress of the injected fluid.

We copy from Dr. Lorent's work the only other instance of severe symptoms produced by morphia, and in reference to this case call attention again to the *dose*, which was far above the maximum quantity generally administered hypodermically:—

"We have seen deep narcotism follow the injection of morphia but once.

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[1] Am. Journ. Med. Sciences, January, 1866, p. 240, from Med. Times and Gaz.

The patient was a delicately-formed male, forty-three years of age, suffering from delirium tremens; one grain of morphia was administered. The pupils were so contracted as to appear entirely closed, perfect anæsthesia to pricking with a needle existed in the skin, the pulse was very slow, respiration sank even to six in the minute, so that, fearing a fatal termination, artificial respiration was maintained. The threatening symptoms, however, soon subsided, and from the favourable termination of the delirium tremens, which soon followed, the large dose seemed to have exerted a good influence." (p. 11.)

It would seem, however, that all the alkaloids are not so reliable as to the relation of effect to dose when used subcutaneously as morphia. Atropia is indicated particularly by Dr. Lorent as a medicine requiring great care in its use with the first injections, and especially with females. He relates a striking case where only $\frac{1}{190}$ of a grain produced very serious symptoms, and two others in which unpleasant effects followed the injection of a quantity below the ordinary dose. Dr. Eulenberg gives a similar case which will be detailed farther on.

Is the effect of medicines thus introduced into the system identical with that following ingestion? With the exception of Dr. Hunter, the authors whose works are before us answer this question in the affirmative, or believe in a far less degree of modification of their action; it is in their effect upon general diseases, or upon diseases of the nervous centres, rather than as used merely for the relief of pain, that he believes them to differ most widely in their action from the usual standard. Thus he says (p. 15):—

"In cerebral affections medicines called anodynes frequently act so far more effectually, and so differently from the stomachic doses of the same, as almost to warrant us in considering them as different medicines."

He maintains that morphia used subcutaneously has a sedative influence upon the circulation not produced by it when absorbed from the stomach:—

"The action of the heart is diminished in proportion to the dose injected. Thus, in mania, I have reduced it from 120 to 80 in four minutes." * * * * "This first and lowering effect produced upon the circulation is a point of practical importance in the treatment of inflammation." (p. 33.)

Atropia, according to him, does not have a similar effect upon the circulation, but he claims to have discovered new or different powers for this alkaloid than those usually accorded to it:—

"Let me first dispel the idea that atropine is a cerebral narcotic. I do not consider it as such. Atropine is rather a stimulant at the onset than a sedative. Its first effects upon the heart, lungs, and general circulation are not those that at all predispose to sleep, as I have shown those of morphia do. But it is occasionally a narcotic, and the sleep is, I believe, brought about indirectly. The *sensations* seem first to be benumbed, pain to be relieved, and sleep follows. The sleep of atropine begins with the eyes open, but the vision asleep, with a few vague movements of the hands; the respiration deep and regular, but not stertorous, and the pulse will continue twenty beats or so in the minute higher than usual." (p. 35.)

The action of medicines is, however, undoubtedly modified in some degree by subcutaneous injection. Thus Dr. Hunter speaks very strongly, far more so than we are yet prepared to do, as to constipation not following opiates thus introduced:—

"Given by the cellular tissue neither morphia nor opium ever constipates. I have used the morphia injection for weeks together, in cases of chronic disease, the bowels acting daily—but never acting without medicine in the same patients, if the morphia was given by the mouth." (p. 18.)

The unpleasant symptoms produced by opiates are not however escaped by administering them subcutaneously. It is, perhaps, expecting too much to anticipate that we shall ever find a means of avoiding the nausea and sickness which follow the introduction into the system of opium and its preparations in some subjects, and which deny their blessings and benefits to so many. Certain it is, as we speedily found by experience, these unpleasant symptoms do follow the administration of narcotics in this way, and all these authors state the fact, although the testimony inclines to the view that the evil effects are lessened in degree, perhaps sometimes entirely escaped. Dr. Ruppaner claims to avoid them by using only a minimum dose—finding a "point of tolerance" of the narcotic beyond which he does not pass. (p. 154.) Dr. Hunter places the frequency of occurrence of these unpleasant symptoms lower than any of the other writers; still he admits that they do occur, and sometimes even prevent the use of these medicines hypodermically as well as otherwise, although in a glowing comparison he makes in one place (p. 15) between the condition of the patient after the hypodermic administration of morphia and after its ingestion, he entirely ignores them.

Medicines injected subcutaneously have a double action—a local and a general effect; they influence the nerves of the part injected, and by the circulation the nervous centres. Which of these is the most important, and does the former depend entirely upon the latter? It will have been already gathered from our remarks that there is a difference of opinion upon this question. All the authorities answer it affirmatively except Dr. Hunter; he alone maintains, and with more warmth we think than the occasion demands, that localization of the injection for a local disease, as neuralgia, is not necessary, and these are his reasons:—

Equal benefit follows the distinct injection—therefore localization is not necessary.

There are certain objections to localization: 1, the infliction of unnecessary pain; 2, the almost certain risk of irritating, thickening, or inducing matter in the part by repletion; 3, many cases of neuralgia would be excluded from treatment were localization necessary.

Commencing with the objections, we feel bound to answer to the first that injecting in the *same identical spot* is not a necessary part of the doctrine of localization, and therefore *more* pain is not occasioned; the answer to the second is already given in our statement, from authorities, of the insignificant local effects produced by the injections even when many times repeated; to the third, and to the proposition laid down that equal benefit follows the injection whether made near to or at a distance from the affected point, we say that by increasing the range of applicability of hypodermic medication benefit is conferred upon the profession and upon humanity, and the author of it deserves credit for the discovery. To Dr. Hunter belongs undoubtedly a share of the credit, possibly the major portion of it, yet we hesitate to decide a question of this kind about which a journal controversy has been carried on for some months between him and Dr. Wood, of Edinburgh; certainly it would not be fair to do so without examining both sides. Dr. Hunter undoubtedly deserves credit for his efforts in extending the practice of hypodermic medication to general diseases, and to diseases of the nervous centres, as mania and delirium tremens, and to this end his doctrine of the non-necessity of choosing the point to inject must have tended.

But we must examine other witnesses in regard to this doctrine that the locality of the injection has no influence in the cure even of such a disease as neuralgia. As we have said, there is great unanimity in favour of the opposite view, Ruppaner considers the question (pp. 36–44), gives his own experience, and quotes Béhier; their pathological experience is strongly confirmatory of their views. Dr. Lorent writes to the same effect. So does Dr. Eulenberg, whom we rather quote because his work is not as accessible as the one in our own language, and because his testimony is given without reference to any controversy or disputed claims whatever, all of this having occurred since he wrote; he simply investigates the question as a scientific problem. He states that in a case of double rheumatic sciatica observed by him, complete relief of pain for a space of from two to three days followed each injection *upon the side upon which the injection was made*, while upon the other side the pain immediately returned upon the subsidence of the effect of the narcotic upon the nervous centres.

But not content with this proof this author instituted a series of experiments by means of a comparison of the sense of touch, as measured by Weber's instrument, applied to corresponding points of the surface upon the two sides of the body. These experiments are recorded and tables of the readings given in his work (pp. 42–51). They show unmistakably that the general view is the correct one. We have only space for his conclusions :—

> "After the subcutaneous administration of various narcotics (morphia, atropia, caffein), the sensibility of the region injected is considerably diminished, while the corresponding symmetrical region of the other side of the body shows no change, or a relatively much lesser degree of diminution."
>
> "If an injection be made at a point where a sensitive (or mixed) nerve runs superficially under the skin (for instance, about the head of the fibula, peroneal nerve), sensibility is diminished not only at the place of injection, but also over the whole surface to which the nerve is distributed; nevertheless, in the greatest degree at the point of injection."

A word as to the remedies used subcutaneously and their doses. Of course only those can be administered which are small in bulk; the next most important quality is ready solubility. The alkaloids, therefore, stand at the head of the list of hypodermic medicines, and, being the great remedy for pain, morphia at the head of the alkaloids. There is quite a wide range of variety, however, shown as to the form; thus Dr. Ruppaner prefers Squibb's liquor opii compositus, of which one hundred drops are equal to one grain of sulphate of morphia; Lebert uses extract of opium and water, of each equal parts; some use one salt of morphia and some another, the acetate being the favourite. For the benefit of those who may desire to commence subcutaneous injections, we have prepared the following posological table :—

	RUPPANER.	EULENBERG.	LORENT.
Salts of morphia . . .	gr. $\frac{1}{8}$—$\frac{3}{4}$	$\frac{1}{8}$—$\frac{1}{2}$	$\frac{1}{6}$—$\frac{1}{2}$
Sulphate of atropia . .	gr. $\frac{1}{60}$—$\frac{1}{30}$	$\frac{1}{60}$—$\frac{1}{24}$	$\frac{1}{40}$—$\frac{1}{16}$
Muriate of strychnia . .	gr. $\frac{1}{24}$—$\frac{1}{6}$	$\frac{1}{18}$—$\frac{1}{8}$	$\frac{1}{25}$—$\frac{1}{10}$
Aconitia		gr. $\frac{1}{30}$—$\frac{1}{15}$	$\frac{1}{30}$
Tinct. cannabis indica . .	gtt. x—xx		
Ext. " " . .		gr. iij—vj	
Liq. opii comp. . . .	gtt. v—lx		
Sulphate of quinia . .		gr. i—ij	gr. j$\frac{3}{4}$

The mode of regulating the dose generally followed is by means of a graduated syringe, or one with a graded piston-rod which screws down, each revolution of the screw expelling a known quantity of liquid. Such instruments are difficult to obtain here and expensive. We have had no trouble in regard to accuracy of dose by measuring the capacity of the barrel of the ordinary syringe with a minim glass; then with a solution of acetate of morphia (gr. j ad aqua f℥j) dissolved with the aid of a drop or two of acetic acid, the dose can be very closely regulated.

Two of Dr. Hunter's rules as to doses are very good:—

> "Concerning first injections, never use more than half the ordinary stomachic dose for males, nor more than a third for females.
>
> "Should a second injection be necessary, let it not be used too soon, nor in a full dose when the patient is partly under the influence of the narcotic."

The range of application of hypodermic medication we have said is not wide; it covers, however, very important ground from the fact that pain, the great torturer of the race, from whose torments our patients imperatively demand relief, can be certainly and speedily controlled by it. The worst of all pain is neuralgic, therefore the neuralgias are best adapted to this mode of treatment; then come some of the spasmodic diseases and of the paralyses; next to these follow diseases of the eye, delirium tremens, rheumatism and gout, and malarious fevers. But without detailing the particular diseases in which it may be used, the general indications may be stated as follows:—

Those cases in which it is necessary to obtain the general effect of a remedy with the utmost possible rapidity and in its greatest power; as, for instance, in cases of poisoning, or of pernicious fever.

When a local and direct effect upon sensitive or motor nerves is desired in addition to the general effect of the remedy; as in neuralgia and paralysis.

When the internal administration of the medicine is interfered with by functional disturbances of the digestive organs; as in cases of obstinate and violent vomiting; or where the ingestion is rendered difficult or even impossible, as in cases of foreign bodies in the œsophagus, trismus, hydrophobia, and the obstinate refusal of medicines by the insane.

Under this last head came a case in the treatment of which hypodermic injections proved to us an invaluable resource; in a delicate and nervous female suffering from gastritis, vomiting was so persistent, so rebellious to all other measures, and so aggravated by even the thought of medicine, that we are convinced no other means would have sufficed to moderate and finally control the disease.

Although neuralgia alone by far surpasses all other diseases in regard to hypodermic medication, we can scarcely enter upon its consideration, certainly cannot go into particulars as to the various forms of the disease. To one point, however, we call attention; the injection of narcotics in this disease must not be looked upon as merely a palliative measure; cures will be effected by this means alone in a fair proportion of cases; thus Eulenberg reports eight cases of radical cure out of twenty-eight treated. Dr. Ruppaner also reports many cases cured without resorting to other means. To this gentleman's book we must refer the practitioner for full particulars as to the treatment of this disease, while we translate from the work of the former the following general observations:—

> "The injection of morphia is the best palliative means for the relief of idiopathic as well as symptomatic neuralgia, and one that almost never disappoints.
>
> "The injections may effect a radical cure in idiopathic neuralgia of recent date and peripheral origin, whether it affects the whole region supplied by a nerve, or only that of a single branch.
>
> "The use of injections in the treatment of neuralgia, however important they

may be, do not justify us in neglecting to consider the cause of the disease as an indication to treatment, nor the use of those other remedies which experience has shown to be useful." (pp. 88–90.)

The twitching of the muscles after severe fractures, and the jerking of stumps of amputated limbs, so often causing patients intolerable anguish, are forms of nervous disturbance which seem to yield in a peculiarly happy manner to morphia introduced subcutaneously.

We prefer to occupy what space remains at our disposal with some of the rarer instances of hypodermic medication.

In cases of poisoning by atropia and hyoscyamus, morphia has been subcutaneously injected, and the results have been so favourable and striking that its antidotal powers in such cases can no longer be called in question. Bell, of Edinburgh, was the first proposer of this method (1857), but many authors have since reported cases—Béhier and Courty, and more recently Graefe. The cases in Dr. Lorent's work, already referred to, in which violent symptoms followed the injection of atropia, were treated by throwing morphia under the skin, and relief followed almost immediately. Eulenberg quotes at length the report of two cases of poisoning by hyoscyamus, from Rezek; the patients were children, three and a half and one and a half years old respectively; the quantity of poison taken unknown, but symptoms violent; loss of consciousness, convulsions, stridulous respiration, widely-dilated pupils; in one case continuing after emetics and other measures had been put in force; then morphia was injected, in one case one-sixth grain, in the other one-eighth grain, when recovery rapidly followed. In the first case—"after five minutes the convulsions became less frequent; in ten minutes the patient was asleep and breathing as peacefully as if nothing had happened."

The following case from Eulenberg is a striking instance of the rapidity of action and benefit of this mode of treatment:—

> "In a lady suffering from facial neuralgia I injected $\frac{1}{48}$ grain of atropia; alarming symptoms of poisoning soon arose. The patient threw herself about the bed entirely unconscious, and from time to time broke out in furious delirium; the limbs and also the head were shaken with convulsive jerkings. The pupils were moderately dilated, the pulse small, somewhat increased in frequency (88). I injected immediately $\frac{1}{3}$ grain of morphia into the temporal region, in close proximity to the former place of injection. The result was striking; the twitchings ceased within scarcely more than three minutes, and in ten minutes the patient fell into a heavy peaceful sleep, with deep, stertorous [!] respiration. The pulse had fallen to sixty-eight in the minute. Upon awaking, eight hours after the injection, both pupils were of normal dimensions, and there were no symptoms of poisoning present." (p. 199.)

There is one curious fact to be noticed in this connection; however speedily and surely morphia may counteract the poisonous effects of atropia, it will not contract the dilated pupils produced by this mydriatic. We quote again from Eulenberg, page 119:—

> "In some cases where atropia had been instilled into the eye for diagnostic, not therapeutic, purposes, I injected morphia (gr. $\frac{1}{8}$–$\frac{1}{6}$) in the neighbourhood of the affected eye, in order to shorten the unpleasant mydriasis. The trials were made upon seven persons, and at from two to ten hours after the application of the atropia. However surely morphia, subcutaneously injected, may act as an antidote to atropia, and however general its production of myosis in a normal state of the pupil, its effect upon the atropia-widened pupils was in the highest degree unsatisfactory. In only two of the seven patients did a slight diminution of the dilatation take place, at six and nine hours after the injection—ten to six hours after the atropia was applied; and in these two cases the amount of

atropia which reached the eye may have been small. In the remaining patients there was no perceptible effect after more than twelve hours, so that the closing of the pupil which followed in the course of two or three days could not be attributed to the morphia."

In the latter part of 1863, Prof. Nussbaum, of Munich, made the announcement that an injection of morphia under the skin, made just before or during the production of insensibility by chloroform would extend and perpetuate the condition of anæsthesia for a period of several hours. So important an announcement deserves attention, and we are surprised that the statement has not ere this been investigated, and either verified or refuted; yet we have looked through the medical journals in vain for any notice of further observations or of experiments instituted bearing on the question. The works under notice probably contain all that has yet been made known in regard to it. Dr. Eulenberg copies briefly from Nussbaum, the four cases upon which his statement is based, and then reports one case which fell under his own observation and which seems to support the theory; next he gives a case in which it failed, and in the appendix speaks of two others, operations for removal of lower jaw, in which it was unsuccessfully tried. We notice that in Nussbaum's cases the amount of the narcotic injected was large—in two cases one grain—a larger dose than it is prudent to administer in this manner to an untried patient, and a dose against which Dr. E. feels compelled to warn his readers "as seldom demanded and causing very easily unpleasant symptoms, very often distressing vomiting." In the successful case which he saw one-fourth of a grain of muriate of morphia was used, and we say it *seemed* to succeed because it was a case of castration during and after which there was much hemorrhage from repeated giving way of the ligatures, with great depression from the loss of blood, and under these circumstances it cannot be looked upon as a fair case.

To assist in solving the problem, Dr. Eulenberg instituted a series of experiments upon animals, and chose rabbits for his subjects. Unfortunately he anæsthetized them with ether; unfortunately, because whether his statement be true or not, that "the condition of the central organs during ether-narcosis is less favourable to the action of morphia than during the narcotism produced by chloroform," the terms of the problem being varied, the results could not bear upon the solution. He only found, however, a prolongation of the anæsthetic condition amounting to minutes, instead of hours, but admits, at the same time, that experiments upon animals cannot decide this question for man. He quotes in connection the experiments of Salva with dogs, the results of which were more confirmatory of Nussbaum's doctrine.

We extract from Dr. Lorent's work (p. 23) his single observation of the conjoined influence of the two remedies:—

> "The combination of quietude by injection of morphia and narcosis from chloroform we have only once unconsciously observed: Chloroform was administered to a primipara for version, after draining away of the waters, on account of cross-birth; one-fourth of a grain of morphia had been previously several times injected. The patient fell into an uncommonly deep sleep, so that the difficult turning and the completion of the birth were entirely unknown to her. She awoke only after a considerable time, and had not the slightest consciousness of the entire delivery."

It is to be deeply regretted that we must await further facts before we can decide so interesting and important a question. To be able to prolong the effects of chloroform without increasing the amount of it administered, and without adding to the risk of unpleasant results, would be a great boon to patient and surgeon in very many operations; the value of it is evident at a glance, and we know few questions which are more worthy of close investigation and an early solution than this.

For the use of subcutaneous injections of narcotics in order, by the local anæsthesia produced, to facilitate laryngoscopy, we are indebted to Dr. Eulenberg, and as this new specialty is attracting considerable attention, we believe we shall do good service by giving pretty fully what has been ascertained in regard to it. The author alludes to the failure of all the means heretofore proposed for the purpose, and quotes Tobold (*Lehrbuch der Laryngoskopie*, 1863) to the effect that operations upon the larynx will always be among the most difficult and delicate of surgery, so long as we do not possess a local anæsthetic with which we can benumb so sensitive a part of the body.

> "This impelled me to try the effect of subcutaneous injections of morphia, especially as it did not appear impracticable to approach pretty nearly the internal branch of the superior laryngeal nerve in the neighbourhood of its point of passage through the hyo-thyroid membrane, and which nerve is principally distributed to the mucous membrane of the upper part of the larynx and vocal cords."

Then follows a case of polypus on one of the vocal cords; the patient could not endure the application of caustic or polypus forceps; cough and spasm frustrated all attempts at removal. After injection of one-eighth of a grain of morphia on each side, the difference was striking, and this proved to be the case upon a second trial.

The favourable result having been observed by Dr. Beneke, "an experienced auto-laryngoscopist," he made a trial upon himself—a trial which resulted in entire disappointment.

Dr. Tobold's attention having been called to the matter, he also gave it a trial in the case of an old lady afflicted with laryngeal polypus. After injection of one-fourth of a grain of morphia, quoting Dr. T.'s own words, "he could touch the lower surface of the epiglottis with instruments longer than it had hitherto ever been possible to do."

The testimony is scanty and unfortunately conflicting; it stands, therefore, another undecided question, but one far from insignificant or unimportant.

In the treatment of malarious fevers, hypodermic medication bids fair to yield as brilliant and substantial results as for any other disease; the certainty and rapidity with which it overcomes pain are rivalled by its control over intermittents, if the testimony of those who have used it is to be relied on. There certainly need be no great delay in deciding its merits, and fixing every detail of treatment. As in many sections of our country malarious fevers are the prevailing diseases during a considerable portion of the year, there is abundant opportunity for trial, as there will be an overflowing measure of benefit resulting should the observations already published be substantiated. Dr. Chasseaud, of Smyrna, was the first, we believe, to institute this plan of treatment.[1] His reports are extraordinarily favourable, so much so as to excite that suspicion which will always be called forth by too warm an advocacy of a measure. He treated cases in which the gastric symptoms prevented the usual mode of medication. Of

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[1] Amer. Journ. Med. Sci., Oct. 1863, p. 533.

150 cases he saw but one relapse after three months, using generally but a single injection, and prescribing occasionally a little iron afterwards. Goudas reported, in *l'Union Médicale*, for 1862 (quoted by Eulenberg), fifteen cases with the like result. Moore reports extensive experience of this plan and with most encouraging results.[1] Turning now to the works under notice for information upon this interesting and important point, we find none at all in those of Ruppaner and Hunter, the rarity of this class of diseases in the section of country where they live being undoubtedly the reason. Eulenberg gives first his experience in solving the question whether an injection of quinia during the cold stage would stop the febrile paroxysm; he reports two cases in which he was successful, the amount used being two grains. We have, in two instances, injected that amount of quinia about an hour before the chill, and put a stop to the disease. Dr. E. next reports three cases in which a single injection was made during the apyrexia of intermittents, and sufficed for a permanent cure. Dr. Lorent's experience has not been great with this remedy; he has injected gr. 1⅞ at the beginning of the cold stage, and has seen the paroxysm shortened, and the disease cured by "several repetitions" of that amount. He has not been able to cut short the disease with so small a dose as two grains. He has found the same practical difficulty in the administration of this medicine which has interfered with its use in our hands—the want of a solution sufficiently concentrated without containing so much acid as to cause too much irritation to the tissues. Moore, who was in the Bombay service, used a solution of "thirty grains of quinia, ten or twelve drops of sulphuric acid, and half an ounce of water;" of this, previously strained, he injects from half a drachm to a drachm. The bulk is here too great, as Dr. Lorent remarks, and he proposes the use of the acetate of quinia, "of which thirty grains will dissolve, by the aid of heat, in two and a half drachms of water." We have had no opportunity of trying this plan; we found, however, that quinia with glycerine is too thick to discharge well through the syringe.

We think it would be difficult to exaggerate the importance of this improvement in our art to those portions of our country scourged by malaria, and we cannot refrain from again urging an investigation of its merits upon the profession, requiring as it does no complicated apparatus, no trained skill in delicate manipulation, but simply a spirit of enterprise, careful observation, and candid report of results. Whether it will entirely or generally supersede the internal administration of quinia or not, there can be no comparison between the two modes in those cases where gastric symptoms are prominent, rendering it impossible for the patient to take or retain the bitter drug in the stomach; in those dangerous cases of pernicious or congestive fever, known through the west as "sinking chills," where the patient's life depends upon bringing the system under the influence of the remedy within a brief space of time. In addition to these points, the economic view of the question is one not unworthy of consideration in the case of so expensive a medicine as quinia; if two or even four grains will suffice instead of a scruple, the money difference to hospitals, infirmaries, dispensaries, and in army practice will be of no small account.[2]

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[1] Amer. Journ. Med. Sci., Jan. 1865, p. 241.

[2] Since the above was in type there has fallen under our notice a report of a letter upon the hypodermic injection of quinia, from Dr. James McCraith, senior surgeon to the Smyrna and Aidin Railroad, read before the Royal Medical and Chirurgical Society in December last. He has found it especially useful in the

In one particular the work of Dr. Ruppaner differs from the others, and we must not omit to notice it. It contains a record of his experience with injections used in a manner different from ordinary, the fluid being thrown deep among the tissues along the course of a nerve, instead of just beneath the skin, the solution being irritant in character with the object of exciting local inflammation and suppuration. The plan is not original with this author, but was proposed by Dr. Luton, of Rheims (to whom due credit is given by Dr. R.), to the Paris Academy of Medicine (Sept. 1863), under the name of "parenchymatous substitution." We will let Dr. R. state the argument :—

> "Cases of neuralgia, especially chronic cases of sciatica, are often benefited by counter-irritation along the course of the affected nerve. It is, therefore, plausible to suppose, that if we inject a strong solution of any irritant near the painful point—for example, in the course of the sciatic nerve—that deep-seated counter-irritation can be established, which, though limited in extent, would be sufficient, if not to remove the disease, yet at least materially to improve it." (pp. 26, 27.)

He claims that a saturated solution of chloride of sodium, or a strong solution of nitrate of silver, deeply injected, does not cause much pain, is not followed by *diffuse*, but by *circumscribed* inflammation and suppuration. The cases he reports are five in number, and support his theory so far as so limited a number can do ; they are interesting certainly for the reason he claims, as being "the first cases of neuralgia treated in the United States by the injection of *irritants*." For further particulars as to this mode of using injections, we must refer our readers to the work itself.

Hypodermic medication is yet in its infancy ; already, as we have shown, it presents a number of most interesting and important practical questions for solution ; that in regard to these, and in other respects, it has a brilliant future before it, we do not doubt, and shall await with interest further knowledge of the subject. J. C. R.

ART. XVIII.—*Stimulants and Narcotics, their Mutual Relations ; with Special Researches on the Action of Alcohol, Ether, and Chloroform on the Vital Organism.* By FRANCIS E. ANSTIE, M. D., M. R. P. C., Assistant Physician to Westminster Hospital, Lecturer on Materia Medica and Therapeutics to the School, and formerly Lecturer on Toxicology. 8vo. pp. 489. London: Macmillan & Co., 1864.

The same. 8vo. pp. 414. Philadelphia: Lindsay and Blakiston, 1865.

UNDER the guidance of researches which have for their aim the comprehension of the most recondite processes of the animal organism, a new school of physiology and pathology has made its way to the favour of the medical profession. It has able representative men, and its teachings

pernicious form of malarious fever, and details the case of a patient "who had been in a profound coma for a long time, and was incapable of swallowing anything, and was rapidly relieved by the injection of three grains and a half of quinia in each arm." Dr. McCraith "does not think the hypodermic method will supersede the usual treatment by the mouth, but that it will prove extremely useful where a great scarcity of the remedy exists, or where the symptoms will not allow of its exhibition by the usual method.

have had a decided influence upon the practical departments of medicine. It must be admitted that the true natural history method of conducting inquiries, applicable in the development of doctrines, which, of late years, have invited acceptance, has had a potent fascination in securing converts, and in moulding opinion with respect to the end and aim of all medical inquiry—the proper treatment of the maladies of the corporeal system. An impetus has been given, and, we conceive, in the right direction, to the investigation of medical truth; yet that a point has been attained where positiveness can be asserted, and that the deductions which have been made are in every particular correct, cannot be maintained. Observation and experiment have, indeed, in the last few years, been so greatly extended, that generalizations, which previously were not warranted, may now be admitted; but the area of investigation has not been fully explored, and can only be defined by the recognition of the last discoverable fact; hence, new generalizations will be called into existence as new revelations augment our knowledge.

There are three directions which biological science has taken in the hands of the observers, who have of late been engaged in prosecuting inquiries. The researches and expositions of Schwann and Schleiden have laid the foundation for the views at present embraced under the title of *cell doctrine*, which, in its application to diseased structures and metamorphic abnormal changes, has found a powerful advocate in Virchow. Another direction has been given to the study of life processes, by the labours of Magendie, Bernard, Brown-Séquard, Müller, Hall, and others, with respect to the functions and modifying influence of the nervous structures; while, lastly, the importance of chemical and physical operations in the vital economy has found expression in the writings of such authorities as Liebig and Mülder, Matteucci and Mialhe. All the phases of investigation and discovery mentioned have their significance and importance; they are the reflection of facts whose interpretation has revolutionized modes of thought and of explanation regarding the operations of the organic system. If any one characteristic distinguishes scientific inquiry of the present time from that of periods which have passed, it is the contemplation of the elaborate processes of the animal organization from numerous stand-points. The truly philosophical student of medical science cannot be the partisan disciple of any one-sided opinion. The truth has been made apparent, that for the acquisition of rational and stable conclusions, of true knowledge, there is entailed the necessity of fully appreciating the correlation of all ascertained facts in the several departments of discovery, of co-ordination by careful comparison of all the materials acquired by observation, and of rigid induction.

The subject embraced by stimulants and sedatives has its origin in the first inquiries into the appropriate methods of treating disease. It may, indeed, be said that it is coeval with medical history, as all the remedies which have been devised, having either directly or indirectly stimulant or sedative effects, may be arranged under one or other of these two great classes. It is the warp on which have been woven also the rational methods that have been devised for the alleviation of human derangments, and constitutes the foundation of all therapeutics. It may appear extraordinary that with all the light that has been accumulating for ages, there is still presented matter for discussion, and that in this nineteenth century disquisition may be entered upon, which has more than one side of proof and argument. Such, however, is the obscurity of the source of vital force that manifestations of its existence admit of more than one plausible explanation. The comprehension of vital phenomena must penetrate to the very "abdita rerum" of the organic system, and the most difficult problems are presented for examination and solution. In the review of the book before us, it will be our endeavour to treat this subject in the just spirit of an inquirer into truth, unbiassed by any prejudice and committed to no hypothesis. Attention will first be directed to stimulants.

An analysis has been made by Dr. Anstie of the general sense in which the terms stimulants and stimulation are accepted, with an historical account of the introduction of these modes of expression. To the first attention will now be directed; and to the latter we shall advert in the appropriate place, as we proceed with the exposition of what is conceived to be the true designation of the words. It will facilitate our progress, and aid us in the discussion, if, at the outset, the conclusions are presented which have been arrived at by the author, while his mode of reasoning and illustrations will receive the notice which is due them as a portion of the elucidation of the subject. The following "proposals" are conceived by him to be justified.

1. "That the use of the word 'stimulant' be restricted to agents which *by their direct action tend to rectify some deficient or too redundant natural action or tendency.*"
2. "That agents which produce excessive and morbid action of any kind in the organism be refused the name of stimulants, even though smaller doses of them may act in a truly stimulant manner."
3. "That the word over-stimulation be entirely rejected from use as unphilosophical and contradictory in terms."

In its ordinary acceptation, the word stimulation is synonymous with excitement, and stimulants are designated to be the agents or means by which this excitement is produced. By excitement is implied *action* or *activity* in contradistinction to the reverse, *inaction* or *quiescence.* The one may be said to be a positive state, while the other is negative or passive. There is nothing obscure or difficult about these definitions; they appeal at once to the understanding through experience of the senses and the judgment, and enter into the every-day language of mankind. The causes of action, of activity, of excitement, are as numerous as the forces which pervade the universe, whose effects are manifested in a thousand ways for contemplation and for study, and with regard to which mind has been exercised in all the branches of science that have been cultivated. It will be conceded on all hands that there are two elements which essentially enter into the problem of activity and excitement; one is the capability of being impressed, or impressibility, and the other is the existence and application of the means by which this impressibility can be reached, the result of which is some form of action. To comprehend such simple propositions no metaphysical abstractions are necessary; the axiom is a plain one. Excitement and excitability are now employed almost exclusively in a restricted sense in connection with living beings.

The source of impressibility, from which excitement in the organic system proceeds, has ever been the theme of wild speculation and crude conjecture, in accordance with the spirit of the times. It has been connected with the soul or spirit, and more or less confounded with pyschological peculiarities in the conjectures of the ancient physicians, or has been attributed to a presiding demon, on which, from the mouth of that blatant medical swaggerer, Paracelsus, the name of Archæus was bestowed.

Even with the earlier medical inquirers, who, after the revival of learning, most conduced to the progress of knowledge, mysticism ran riot in the endeavour to explain what is inexplicable, the source and nature of the life force which constitutes the basis of vital processes. With the abandonment of attempts, beyond the human powers, to comprehend life-essence itself, and the realization of the futility of such speculation, came simplicity of language. That a state or quality exists in living tissues which is responsive to exterior influences, a species of *vis insita*, to which are to be referred the various movements of the economy, may be accepted by the understanding, in the same way as gravity, or attraction, or any other inscrutable force pervading matter. This is as far as our knowledge penetrates, for of its nature we are profoundly ignorant. The vital processess, and not their remote cause, become the legitimate objects of investigation.

Is the excitability identical in all the tissues and organs of the body, or has each one of them something which is peculiar to itself, which controls and regulates the formative operations and vital actions which are going on in it, is a question, the solution of which is as difficult as the preceding. The following remarks of Virchow have reference to this point:—

> "If we speak of the life of the individual parts of a body, we must also know in what way life manifests itself, and whereby it is essentially characterized. This characteristic we find in *activity*, an activity indeed in which there is displayed by every single part, whilst it contributes its contingent, according to its peculiarities, to the general activity of the body, something identical with the life of the other parts; for else we should be in no way justified in regarding life as something in every case similar, and derivable from some common origin. This vital activity is, as far at least as we are able to judge, nowhere, in no part whatever, carried on by means of any cause allotted to it from the very beginning, and entirely confined to it, but we everywhere see that a certain *excitation* is necessary for its production. Every vital action presupposes an excitation, or, if you like, an irritation. The *irritability* of a part therefore appears to us the criterion by which we can judge whether it is alive or not."[1]

The investigation of the effects of stimulants extends into all the tissues and organs of the body. It is inevitably complex from the close relation which exists between the tissues and organs, and their mutual dependence. In this resides the difficulty of analysis and in the determination of species among the agents which are included by the class of stimulants. They have been divided into *general* and *particular*, but the nature of the economy is such that the distinction is tenable only in the broadest acceptation.

It has been stated that stimulants induce action; without them in a natural state no action can be continued; and the impression may at times be attended by more than normal action without perversion of function, or structural damage of organs.

Among the organic structures none are more palpably reactive to stimuli than the nervous. Experimentally the nervous tissue is the only one of which it can be affirmed that the effects are directly produced, as with respect to other tissues there is sufficient doubt for argument and discussion, whether the results from the application of stimuli arise from the direct impression upon them, or through the instrumentality of nervous matter. In the study of the operation of stimulants upon the nervous system, we must be guided by the physiological laws, which so far have been discovered to pertain to it, and this involves the full scope of nervous influences in their connection with all the organs. Under the operation of this class of agents the nervous system is to be considered as furnishing the means of communication with the external world, as well as presiding over functional and organic movements of the organs, indeed the distinction that has been made between the animal and organic movements is obvious under the employment of stimulants, and consequently the sympathies which are associated with either class are brought into relief under their operation. The will-sympathy, the sensori-motor, the purely reflex or automatic, and the nutritive sympathies are all obedient to their impression. Pure nervous action is induced by an impression upon the peripheral termination of the nerves distributed throughout the structure of the organs, or upon the central nervous masses from which irradiation of motor power proceeds. In the case of the direct impression upon the peripheral extremities of the nerves it is conveyed, in the line of *cognizance* or *incidence*, along the sensitive nerves to the central nervous masses, while the effects which follow, being due to reflex action, are produced in the line of reflexion to the organs and tissues. This impression may or may not be attended with perception. Where an impression is made upon the central nervous masses without the instrumentality of the incident nerve and an increase of motor power is transmitted to the organs, absorption for the most part is indispensable.

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[1] Cellular Pathology, Am. ed., p. 329.

From physiological induction the conclusion is inevitable that certain remedial stimulants by impressing the peripheral terminations of the nerves react upon the entire system. In this way it is that local stimulation is transformed into general, for the application of heat, of mustard, of turpentine, or the volatile oils, of ammonia, and capsicum, to the surface, induce a wide spread effect upon the organs irrespective of the reflex manifestations perceived in the part itself. When like agents are introduced into the stomach or alimentary canal a similar operation becomes manifest, the reflection is not only back again to the mucous surfaces interested, but extends to the heart and general circulation, to the respiratory apparatus, to the secerning organs, and is exhibited in the rise of temperature, in the increase of absorption, and in the nutritive processes, while the nervous operations of every description are under renewed or augmented impulsion.

When medicinal articles are introduced into the economy and have ample time for absorption into the bloodvessels so as to be carried to the central nervous masses, and there produce their impression, more decided manifestations of their influence are brought about. In this way it is that an impression of stimulation commenced upon the peripheral nerves cân be sustained and made more durable and effective. In the depressed states of the organism, as from cold, or exhaustion of vital energy from any cause, both these modes of operation by stimuli are highly important. From the comparison of the condition of vital movement in the organs and tissues before and after the use of such medicinal agents, it is clear that an increase of action has been produced, for rapidity of movement is the index of activity. With reference to the occurrence of active phenomena after the employment of stimulants, the definition which has been given of this class by systematic writers is perfectly in accordance with the results which are presented.

But when stimulants are introduced into the circulation they are carried in its round to *all* the tissues. They are not only conveyed to the interior substance of the central and the distributed nervous masses, but into every organic texture, so as to impress the life force which is peculiar to it. There follows, as a consequence, from agents thus conveyed, a modification of the interstitial movements and conditions. With respect to this mode of operation the question arises, are the interstitial movements and operations of the tissues under the control of the nervous system as the instrument of activity, or is there an inherent self-sustaining energy which is independent of this commanding power in the economy, and which resides in the primary or basic structure of the tissues? The examination of this question is connected with the consideration of the doctrines of cell arrangement and cell action. The most eminent exponent of cell influence in the operations of the animal body is Virchow. It is from him, therefore, that we may derive the exposition of the views which are entertained by this class of physiologists in opposition to those which are advocated by the so-called neuro-physiologists and pathologists. The antagonism which has arisen between these two classes of interpreters of life movements has, perhaps, in the too partial zeal which is evinced, led to an unwarranted leaning to one side or the other, as all the facts which experiment and observation have unfolded must be duly weighed, not only for their own separate intrinsic value, but for their bearing upon the explanation to be given of all the vital processes. The advocacy of an independent force in ultimate cell construction of the tissues is emphatic on the part of Virchow, and he has argued his cause of *irritability* in them, or the power of excitation irrespective of nerve influence by appropriate stimuli, with especial ability. It is, therefore, necessary that the grounds of his conclusions should be presented.

The first position assumed by this author is with respect to the anatomical distribution of the nervous system relatively to the ultimate constitution of the tissues. It is admitted by anatomists and physiologists that cell structure, whether it be that which in different forms enters into the composition of animal structures, or the "connectile tissue," constitutes the groundwork of all the organs. Taking the skin as the subject of illustration, he states:—

> "In the greater number of papillæ we see a single, or when the papilla is very large, a branched vascular loop. The *majority of these vascular papillæ have no nerves*; others again, which contain tactile bodies, no vessels. If we imagine the vessels of tactile bodies removed, there remains only a very small quantity of substance in the papillæ, but within it there are still morphological elements, and it is easy to convince one's self that connectile tissue with its corpuscles (which latter after injection are very easily distinguished from the vessels) is in immediate contact with the cells of the rete mucosum."[1]

Again, after describing the nervous terminations in the Pacinian bodies (flat prolongations), and by loops, he says:—

> "We here find two complete contrasts in parts which in themselves are quite analogous; for on the one hand we have nerveless but vascular, on the other non-vascular papillæ, yet provided with nerves. The peculiar relations which the layers of the rete mucosum and epidermis bear to the two kinds of papillæ, do not appear to present any essential differences. They are nourished just as perfectly over the one sort as over the other, and seem to be just as little provided with nerves over the one as over the other."[2]

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[1] Cellular Pathology, &c., Am. ed., p. 280.

[2] Ibid., p. 278.

Still further:—

> "Thus much, however, we can even now say, that it is incorrect to imagine that a special nervous branch exists in every anatomical division of the skin: just as physiological experiments show that considerable sensitive districts exist in the skin, so also more minute histological investigation teaches us that there is a relatively scanty termination of nerves upon the surface. If, therefore, we think fit to divide the skin into definite territories, those appertaining to the nerves will, as a matter of course, be larger than those belonging to the vessels. But every vessel territory (papilla) also which is marked out by a single capillary loop is divided into a series of smaller (cell) territories, all of which certainly lie along the banks of the same vessel, but still have an independent existence, each of them being provided with a special cellular element."[1]

From the anatomical arrangement he argues an independence with respect to physiological and pathological activity in cell structure, as

> "It is quite inconceivable how a nerve which lies in the middle of a whole group of nerveless parts, can contrive to force a single papilla from among this group, with which it has not the slightest connection, into a state of pathological activity in which the remaining papillæ of the same territory take no share. Just as difficult is it, in the diseases of non-vascular papillæ, to find an explanation which shall accord with the views of a humero-pathologist. Even when in a vascular papilla, the different cell territories attain different states, these would not admit of a ready explanation, if we were to regard the whole process of nutrition in a papilla as directly dependent upon the general condition of the vessel which supplies it."[2]

Another source of argument in favour of the excitability of the cell organization of tissues irrespèctive of nervous action is derived from the modifications which are undergone by those not possessed of nerves when stimuli are brought to bear directly upon them. An illustration of this is taken from articular cartilages, as in Redfern's experiments. "If we draw a thread through a cartilage, so that merely a traumatic irritation is produced, we see that all the cells which lie close to the thread become enlarged through an increased absorption of material. The irritation produced by the thread extends only to a certain distance into the cartilage, whilst the more remote cells remain altogether unaffected." The same opinion is derived from the cell structure in the skin and other tissues in the body, and it is urged by Virchow, "that such observations cannot be explained otherwise than by assuming that the stimulus really acts upon the parts to which it is applied; it is impossible to conclude that it is conducted to the nerve by any channel perhaps more in accordance with the neuro-pathological doctrine, and then only by reflex action conveyed back to the parts."

The peculiar excitability of vegetable textures, as exhibited in what is termed the irritability of plants, and in the growth or the metamorphoses of which they are susceptible, as well as that of the lower orders of the animal creation, where no nerves are found nor even muscles, has also been advanced, as a still further argument, in favour of the positive independence of cell organization in the higher orders of animals.

The different actions that can be provoked by the impression of stimuli may be placed under the heads of *functional, nutritive, and formative*, and therefore these three modes of operation become the subject of consideration. Although the functional and nutritive, and the nutritive and formative processes are, in a number of instances, intimately blended, and there may be a difficulty of drawing the line of demarcation between them, yet a clear distinction in so many cases may be recognized that there can be no embarrassment in making the application of the statements which have been made with respect to the manner in which stimulating agents operate. In the discussion of these points we shall follow the order that has been given. In accordance with this, *functional* operations first demand attention.

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[1] Cellular Pathology, Am. ed., p. 282.

[2] Ibid., p. 283.

Muscular contraction is intimately associated with functional activity of organs. It is either the sole operative power, or it is essential as one of the operative forces by which function is conducted; in point of fact, wherever muscular fibre exists, an office is assigned it which is connected with the functions. Long before the doctrine of cell action took definite form, the disquisition with respect to independent contractile power in the muscles occupied the attention of physiologists. Haller, the father of modern physiology, was an uncompromising maintainer of the position that muscular contractility, which he denominated irritability, was inherent. This inherent capability of contraction by muscular fibre has been the moot point of physiologists even to the present day, and both aspects of the question have been maintained by authors of eminence. Tiedemann agreed with Haller in regarding the muscular contractility as a peculiar property resident in the muscles themselves, but believing that the maintenance of this property in them was dependent upon nutrition and nerve influence, he further held that the nerves do not merely conduct the stimulus which excites the muscular contraction, but afford an essential condition for the manifestation of the vital property of the muscles. Müller and Hall are advocates of the nervous origin of contractility, while Carpenter and all the advocates of cell action are supporters of the opposite view of the subject. It is difficult in the present position of the question to pronounce positively upon the point at issue. The close connection between nervous control over muscular contraction and the function which muscles are destined to perform, and the whole development of nervous sympathies in which muscles are interested, almost preclude right judgment in so obscure a problem. Experiments may be adduced which inferentially incline to both sides, and the real difficulty lies in an almost impossibility of isolating the primary muscular fibre and submitting it to experimental study. The nearest approach to this has been made by Mr. Bowman, who informs us that a single fibre completely isolated from its connections may be seen with the microscope to pass into a state of contraction under the influence of direct irritation. Relatively to stimuli, it may be safely affirmed, that even admitting an independent life force in muscular structure, which manifests itself by contraction, this life force is so closely connected with the life force of nervous structures as to be under its control, obedient to its commands, and in a measure impaired by its abstraction.

Through the medium of the nervous system stimuli affect the several muscular apparatuses which are provided for the sympathies concerned in maintaining the existence, and conducing to the well-being of the individual. Most of these sympathies are automatic and are classed under the excito-motor, although the other sympathies, as the will, the sensori-motor, and even the nutritive, come within the circle of influence by nervous action. Functions of organs are deeply interested in the preservation of these sympathetic associations in the state of normal efficiency.

Muscular action in the heart is the foundation of the circulation of the blood by that organ, and there is no doubt that it can be impressed by causes operating through the nervous system. Leaving out of the question moral or mental impulses, agents which operate upon the nerves by a reflex action are capable of quickening the movements of the heart. That this organ can be excited by the direct application of stimulants to its nerves has been shown by experiment. Humboldt, by galvanizing the cardiac nerves in a (apparently) dead rabbit, produced contractions; and Burdach, by galvanizing the cervical portion of the sympathetic nerves or the inferior cervical ganglion, accomplished the same result.[1] The latter author reaccelerated the actions of the heart in a rabbit after they had begun to fail, by touching the sympathetic with caustic potassa and ammonia. From the experiments of Legallois, Wilson Phillip, and others, it is accepted as a conclusion by Müller "that the brain and spinal marrow have a great influence on the motions of the heart, that its movements may through their agency be accelerated or retarded, depressed or invigorated."[2] If, then, the heart can be impressed through the nervous structures with which it is provided, and taking, as it does, a most distinguished place as an index of the impression of exterior and interior agents, there is no reason to doubt that, in the same way, medicinal stimuli applied to near or remote organs of the body can, by afferent and efferent or reflex action, produce their effects upon this as upon any other muscular apparatus. That the heart should be independent of the nervous system, so far as an absolute maintenance of its actions is concerned some time after a separation from the connection with its central masses, is a most important salutary provision of nature, as otherwise it would be subjected to deranging and even fatal contingencies. Were this not so, nervous collapse would be followed by irrecoverable suspension of movement of this essential organ of life. The heart then must be quickened in its activity by the application of stimuli to the skin, the stomach, or the bowels, and in depressed states of the circulation, reaction has a genuine source in the impression made upon peripheral nerves. But an impulsion commenced in this way must be sustained by the introduction into the circulation, and a direct influence upon the organic structure of the heart, and this may be either upon the inherent excitability or by modifying the nutritive acts in the interstices of the tissues. In the production of persistent effects upon the action of the heart, the influence derived from the direct impression upon the nervous centres by a conveyance of stimulating material into their structure, and a transmittal of the augmented nervous motor force thus generated, should not be overlooked.

What is true with regard to the heart is especially so in connection with the respiratory movements. There can be no dispute with reference to the relation between the respiratory apparatus and the spinal marrow. If the communication be cut off from the medulla oblongata, the movements of the chest are suspended, and, as now understood by physiologists, the respiratory efforts are maintained automatically by reflex action, in obedience to an excitant impression upon the periphery of the nerves distributed through the parenchyma of the lungs. The probability is that the inciting material is carbonic acid, although the discomfort from the presence of venous blood, and the relief afforded by its oxygenation, in which resides the "besoin de respirer," may give rise to inspiration. It has been asserted by Dr. M. Hall, that the spinal marrow never sleeps, and hence the persistent recurrence of the rhythmical movements, which are necessary for the continuance of life. The whole series of sympathetic associations are known to be brought into play by the application of stimulants to the excitor nerves which can be traced to the spinal centre; hence, the production of forced respiration manifested in sudden inspiration and expiration attending sneezing, coughing, &c., which arises from this connective arrangement.[1]

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[1] Elements of Physiology. By J. Müller, M. D. London, 1840. Translated by Baly, i. 202.

[2] The reverse of stimulation, or depression of the heart's actions by shock or transmitted influence of lesion has been cited as additional evidence of the control of the nervous system over the heart. Thus, blows on the stomach or elsewhere produce stopping of the heart, and, as found by Brown-Séquard, when either the par vagum, or the spinal cord, or the splanchnic nerves, are cut, any kind of irritation may be made on the abdominal sympathetic without a stoppage of the heart's action.

The stimuli which impress the heart must extend their operation to the lungs, as the state of the respiration keeps pace with the activity of the circulation. Exercise and heat, from their acceleration of the circulation, have a corresponding effect upon respiration.

Reflex stimulation is operative in connection with the stomach; in this way the organ is appealed to, in order to sustain the action of other organs; or it may lead to perversion of the normal state, as is illustrated by vomiting. Upon the same principle the motion of the bowels, whether peristaltic or in the forced efforts of defecation,[2] and the operation of voiding the bladder may be explained. So far, then, as the nervous system is concerned in the functional acts performed by muscular structure, this mode of operation through reflex action is one of the most prominent and best understood operations of the economy.

The *secretory* functional operations are obedient to the impression of stimuli. That this obedience may partly be referred to the nervous system, and accounted for by reflex action, has the sanction of experiment. The introduction of sapid bodies or irritants into the mouth will produce an increased flow of saliva; thus pellitory or tobacco are sialagogues. In the beautiful experiments of Bernard, the full philosophy of this association between nervous action and secretion has been displayed before us. In the submaxillary gland, when the secretion of saliva was promoted by the introduction of a little vinegar into the mouth, the colour of the blood in the return vein became of a red arterial appearance, and as the function ceased to be performed, slowly became dark. To determine how far this change was dependent on nervous action, the branch of the *lingual nerve* distributed to the gland was isolated, and a tube placed in the duct. *When the nerve was galvanized, the secretion was brought on, and with it the red coloration of the blood in the vein.* When the galvanic stimulation ceased, the secretion was suspended, and the blood became dark. When the nerve was tied, the blood was dark, and secretion suspended; but when the nerve was galvanized, the red colour of the blood appeared as before, with the occurrence of secretion. When the means of accomplishing reflex action were interfered with by cutting the branch of the lingual nerve, the application of vinegar to the mouth produced no secretion. The same experimenter discovered that the secretion of urine could be produced by inserting a tube into the urethra.

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[1] An illustration may be derived from the case of extreme exhaustion in consumption, and the liability to asphyxia from accumulations in the bronchial passages, where relief is derived from calling into play respiratory sympathy by the administration of carbonate of ammonia. The stimulation made upon the stomach is extended to the spinal marrow, and reflectedly to the muscular parietes of the chest and to the diaphragm. Coughing is thus induced to the relief of the patient.

[2] That the peristaltic movements of the bowels are affected by impressing the nervous system is shown by Müller. He applied potassa fusa to the cardiac ganglion in a rabbit, and the peristaltic movements of the intestines became very vigorous.—*Elements of Physiology*, vol. i. p. 786.

There is proof to be adduced of the production of other similar phenomena which have a like explanation. Dr. Brown-Séquard has stated that several times he has seen in dogs having an artificial gastric fistula the injection of warm water into the rectum, followed by the secretion of gastric juice. Dr. Gairdner records the case of a man whose œsophagus was divided, and who had a secretion of six or eight ounces of saliva during a meal of broth injected into his stomach. The excitation of the nerves of taste produces an abundant reflex secretion of gastric juice into the stomach, and of bile and pancreatic juice into the bowels. The increased flow from the glands affording the above-named secretions may likewise be promoted by stimulation to their ducts, and sufficient evidence has been afforded of an augmented flow of milk by excitation to the nipple. These have been instanced as nutritive sympathies, and although inseparable from cell action, yet this is supplied by areolar circulation, which again is provided with nervous fibrillæ.

There may be matter for speculation, why the glandular system of the fœtus, perfect in its functional capabilities at birth, has been so latent until the child has been ushered into the world. Why should not the liver, for instance, secrete so abundantly as to cause purgation in the uterus? Is it not due to the want of excito-motor nutritive excitement from the alimentary canal? And so of other secretions. The bladder of the new-born babe is sometimes, as we have seen, forcibly emptied, as soon as cool air is brought in contact with the surface; this evinces that in a modified degree secretion has been going on *in utero;* but there is no urinary odour to the liquor amnii to show that it is habitual to the fœtus to empty the bladder, and it must therefore be but to a limited extent that urine is secreted. Dr. M. Hall, in a paper published in the *London Lancet* for 1857, announced the existence of a nervous arrangement which was termed excito-secretory. A claim for originality, in connection with this idea, was subsequently admitted by him in favour of Dr. H. F. Campbell, of Georgia. A separate system of nerves has been supposed to be appropriated to the special purpose of regulating secretion, but this may be resolved into the function of the ordinary sympathetic, which has its origin and connections with the medulla spinalis.

It may be asserted that with all the evidence before us of reflex secretory action, the whole series of phenomena are due to the effect upon the capillary circulation of each particular secretory organ. This view is taken by Bernard when he states "that the special nervous system, which animates each capillary system and each organic tissue in each part regulates the course of the blood in accordance with the especial chemical functional condition of the organs."

Dr. Anstie has inferred that increased secretion does not necessarily imply stimulation of the secretory glands or of the nerves governing them, and this inference is predicated upon the researches of Bernard and Brown-Séquard, where the section of the sympathetic cervical nerve was followed "by intense congestion of the vessels beyond the point of section, contraction of the pupil, copious secretion or flux from the several glands of the corresponding part." The experiment has been detailed of tying the lingual nerve and suspending secretion, of galvanizing it and producing secretion. When the sympathetic is galvanized, the blood becomes black; when it is cut, the blood becomes red Now a red coloration of the blood is an attendant upon secretion, and black coloration is associated with non-secretion; if the sympathetic be cut, the blood becomes red and secretion occurs.[1] The explanation, therefore, is, not that the nervous influence being cut off secretion takes place, but that there is the preponderance of another nerve, the lingual, which causes the blood to flow more freely. The expulsion of saliva is associated therefore with a state of repose of the sympathetic and of activity of its antagonist, the lingual. A difference also was perceived in the character of the secretion, in the richness of the blood in fibrin, and in the amount of oxygen in the blood when the nervous actions were interrupted or quickened.[2] The facts, cited from Dr. Gairdner and others, of flushing of the face and sweating of the side as a consequence of pressure on the sympathetic of the neck by a tumour, and of Dr. Anstie's own interesting case, which is one of reflex paralysis affecting the circulation with flushing and copious sweating of the whole left side of the face, cannot be said to have another solution than the one which has been given.

Closely associated with the question of nerve control over secretion is that of the influence of the nervous system upon the nutritive acts and processes. In order to have a full appreciation of this interesting inquiry, it becomes necessary to determine what constitutes the nutritive acts and operations. By nutrition is meant the maintenance of the corpuscular constitution of the tissues, their growth by the production of the same forms of organization, and when impaired by waste or accident their regeneration and repair.[3] Irrespective in their essentiality of direct nervous or vascular dependence, as the nutritive acts are maintained to be by the advocates of the pure cell doctrine, they cannot be said to be so free from the control of either. The ultimate structures must have their due supply of material for assimilation; this is accomplished through the instrumentality of the vessels by which is supplied the nutrient fluid, the blood, which is compound in its nature and contains the elements from which can be formed, by an elective organic chemical process, each particular tissue of the body. If the vessels are obstructed, the vital activity is impaired, as neither wonted stimuli or nutriment can be conveyed to them, and death more or less extensive follows. The acts of nutrition resolve themselves into physico-chemical and vital, and the points which are involved in the inquiries into the nature of nutritive operations are the most obscure in the whole round of physiological research. In respect to these our information is encompassed with the greatest difficulty, and there is danger of mingling facts with assumptions. It may be said that much advance has been made towards ascertaining the part which is allotted to physical and chemical processes in sustaining nutrition; but there is an agency which lies deep at the foundation of this operation. It is that power or force of assimilation which appropriates the substance matter that is afforded, converting it into an integrant portion of the tissue and endowing with life and animation the previously lifeless material that is supplied for nutriment. Herein lies the mystery that cannot be solved —the imparting of life force to inanimate substances, with respect to which we are as much in ignorance as in the earliest stages of investigation.

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[1] Bernard: Journal de la Physiologie.

[2] Journal de Physiologie, p. 25.

[3] So long as normal nutrition is carried on, the definite form of ultimate tissues is preserved, but when nutrition is perverted from causes which are foreign to it, discordant elements enter into combination and new forms are communicated to the extent of completely metamorphosing the tissues. The modifiers may be vital or physico-chemical.

It is a law that life can only be perpetuated by a renewal of the material of the elementary structures, not only by the conveyance of new matter for assimilation, but the removal of the old, and its excretion from the organic mass. What is conveyed in the fluid state may be rendered solid, and what has been solid becomes liquefied and in this form is excreted. The circulation of the blood by carrying and removing nutrient materials is an important feature in the higher orders of animal life, as nutrition is effected through the coats of the capillary vessels, and these are permeable only to substances in solution. Müller remarks that "the permeable parietes of the capillaries are, in fact, no impediment to the process of nutrition, which appears to consist in matters dissolved in the blood being attracted from it by the organic particles in meshes of the capillaries, while, at the same time, the old materials of the particles are returned into it." Osmosis may therefore be considered as intimately connected with the radical nutritive processes, or, in other words, with cell action.

Sufficient detail has been entered into, in the preceding exposition, to enable us to consider the control which nerve influence has over nutrition, and to determine how far it can be impressed in this way by stimuli. By Dr. Séquard it is asserted "that an irritation starts from an excitable part of a nerve; it reaches the nerve centres, and thence being transmitted to a more or less distant part of the body it produces either a contraction of a bloodvessel, and through this a diminution of nutrition, or it acts directly upon the tissues and produces an alteration of the interchanges between them and the blood."[1] In support of this opinion the cases are cited of injury to one eye being reflected to the other; of neuralgia of the trigeminal nerve producing congestion of the eye, and a similar congestion being occasioned by a caries of a tooth. Reflex inflammation by the neuropathologists is accepted as a positive occurrence. Atrophy of parts is also attributed to this cause. The results which follow upon cutting the sympathetic have also been adduced as indicating the importance of nervous supply to the tissues; thus the division of the sympathetic in the neck, or the destruction of the cervical ganglia, is followed by dilatation of the bloodvessels, injection of the conjunctiva and of the ear, elevation of temperature, increased secretion of tears and cerumen in the ear, more rapid absorption and increased sensibility; while the nutrition of the eye is so modified and interfered with as to cause retraction of the eyeball, &c. These results have occurred in the hands of Bernard, Séquard, and others. In the experiments upon the trifacial by Magendie, the cornea became opaque or red and inflamed, and secreted a puriform lactescent matter; the eyelids were wide open and immovable, or stuck together by tenacious puriform matter; the iris and the interior of the eye became red and inflamed and formed false membranes, which filled the chamber of the eye and gave opacity to the cornea, or the cornea became ulcerated and the contents of the eye ran out so as to give place to a tubercle. Abercrombie's observations of similar results from paralysis of the fifth nerve may also be referred to in illustration of such nutritive derangement.

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[1] Lectures, p. 156.

But there is another side to the explanation of the phenomena which have been presented. It is the essential feature of cell doctrine that a "power is possessed by individual parts (tissues) of taking up, when excited by definite stimuli, more or less matter and transforming it." "A part which nourishes itself can, in doing so, either limit itself to a mere maintenance of its existence, or may, as is seen in pathological cases, take into itself a larger quantity of nutritive material than is wont to happen in the ordinary course of things." The arguments adduced by Virchow in favour of this independent nutrition have, to a certain extent, been presented; but further, as in the instance of cartilage, the skin may be subjected to the experiment of drawing a thread through it, and here we have, what is not the case in cartilage, whole series of nerve territories intersected by it, yet the whole of the *territories belonging to the nerves* which lie along the thread are not thrown into the same morbid condition, the nutritive irritation being limited to the immediate vicinity of the thread. Around the thread drawn through the skin, a number of young cells generally show themselves as early as the second day, and the same change may be brought about by the application of chemical stimulus. "If, for example, caustics be applied to the surface of a part, the first thing that happens is that the cells swell up, and then when the process follows a regular course, divide and begin to proliferate more or less abundantly," and it matters not "whether the part be provided with nerves, or destitute of them, whether it contains vessels or not."

With respect to the local inflammations which follow lesion of nerves, as in the case of the eye, these are attributed to the irritation which is produced by foreign bodies, which view is based on the experiments of Snellen, who "sewed before the eyes of animals, in whom the fifth nerve had been cut, their still sensitive ears. From that time the animals had no more attacks of inflammation, inasmuch as on the one hand a direct protection was afforded to the eye, and on the other the animals were preserved from all traumatic influences." The inference which is drawn is that there is no form of disturbance of this kind known which can be traced to the abolition of the action of a nerve. "There is always required in addition some special irritation, either of a mechanical or chemical nature, and proceeding either from without or from the blood, in order to induce the peculiar liability."[1]

From the present state of information the conviction cannot be dismissed from the mind, that while nutrition may be dependent upon a force resident in the tissues, and upon operations which are vital, physical and chemical, which are intimately blended and co-ordinated for the production of the phenomena presented to observation, still, as there is needed the office of the bloodvessels, and as these are impressed by the action of the nerves, this nutrition is indirectly under the influence of the nerves, and to an extent modified by their activity or the reverse. It has been seen, from the experiments which have been cited, how far the blood is changed under the action of the vessels produced by agents through the nerves distributed to them, that it was red or black as contraction or expansion occurred, and that it was to a greater or less extent oxygenated. It may also be assumed that the physical acts of osmose must be influenced not only by the condition of activity or otherwise of capillary circulation, but by the nature of the nutrient fluid. The chemical changes which are involved in nutrition must be governed by the fluctuating nature of the material, hence nutrition may be regarded as a circle of links which are mutually dependent. The reflex action of stimuli upon nutritive operations in the tissues may, therefore, be admitted in the same way as reflex secretory action.

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[1] Virchow, Cellular Pathology.

Having presented the evidence of the agency of nervous action in the production of secretion and its influence over nutrition, it remains to notice the operation of stimuli upon these processes by introduction into the circulation, and a direct conveyance to the substance of the tissues. The special action of certain substances upon the secreting organs is at the foundation of a large amount of medication which is employed. That stimulation can be directed upon the kidneys by the use of the terebinthinates, digitalis, squill, and other articles is not disputed, while a similar increase of activity can be generated in other organs, as the liver and the salivary glands, by the employment of articles which must be introduced into the circulation. In these cases from the occurrence of effects so uniformly, when the articles are exhibited which operate on these organs, as it were by preference, it is reasonable to suppose that there is an elective affinity between the articles and the cell tissue of the organs, and that as secretion as well as excretion are due to cell action, it is upon this that the force of stimuli is expended. Virchow admits the fact mentioned in the following statement:—

> "Nearly everywhere do we find specific relations or affinities to exist. If we cast our eyes upon the glands, it is a well-known fact that there are specific substances, by which we are enabled to act upon one gland, and not upon another; to rouse the specific energy of one gland, while all the others remain unaffected. In the case of glands it is certainly much more difficult to exclude the influence of the nerves than in that of ciliated epithelium; still, certain experiments are recorded in which after the section of all the nerves, say of the liver (G. Hartung), it was found possible by means of the injection of irritating substances into the blood (these being such as experience had shown to bear some intimate relation to the organ) to provoke an increased secretion in the organ."

But many substances introduced into the circulation are not possessed of so definite determination; they are not simply foreign bodies, to be disposed of by the emunctories, but exercise a true nutritive office, and if not adding material to the composition of the tissues, at least promote the nutrient acts, or modify the nutritive conditions. The effects of such substances may be rapid and evanescent, or they may be permanent; ammonia and alcohol will produce the former, while the bitter tonics and preparations of iron will certainly, by continuance in small doses, add to the force and perfection of the nutritive operations; a more vigorous nutrition is promoted by their use, and in this light they become by assimilation a species of food for the tissues. That alcohol partakes of this character is evidenced in the greater production of fat, and even its embarrassing deposit in some particular organs, as the liver or kidneys, &c. What applies to the tissues generally is equally applicable to the nervous and vascular structures; they also in the same manner are constituted of cells, which with varying nutritive elements carry on the interior acts of life which fit them for their functional office. While the introduced nutritive stimuli are operative on the tissues in the way that has been represented, they also maintain the nervous system, either in its centres or in its ramifications, as well as the bloodvessels, in a state most conducive to perform functional requirements. The cell activity of healthy grade promoted by stimuli, with full supply of nutritive material, is at the foundation of that vital energy which is characterized as tonic.

The phenomena which follow the application of stimuli are various, and in the endeavour to interpret them correctly, we must be directed by the light which physiological experiment has so far afforded us. The questions at issue are inseparably connected with the determination of the causes of these phenomena, the obscurity of which has led to the different expositions which have been given, which after all do not so much imply a disagreement with regard to facts, as a difference of the terms employed. One of the evidences of stimulation of a tissue is the contraction which takes place in it, and this is due either to reflex action by means of the nerves upon the capillary vessels, or to the existence of an inherent contractility in the tissue which is amenable to stimuli. As a consequence of such impression the part becomes pale and constricted; in the case of the skin the papillæ are elevated and the surface roughened, the blood is removed from the tissues, and an evident check is given to the nutritive processes. Heat or cold will produce constriction of the skin or other tissues of a vascular character, and this is followed by a reverse condition or expansion of the vessels, with an increase of coloration and of temperature, from which it is clear that a larger amount of blood has been determined to the part. If we adopt the purely nervous rationale of these effects of stimulation the active stage is that of contraction, and the passive one that of relaxation, precisely as in the experiments of Bernard and others, where stimulation of the sympathetic nerve was followed by contraction of the vessels and pallor of the ear of a rabbit, and division of the nerves by expansion of the vessels and increase of temperature. According to such hypothesis there is induced mere passivity of the vessels, when stimulation is followed by redness and heat. Still attributing the phenomena to purely nervous action, is the explanation to be given, predicated upon the idea that there are two sets of nerves in vascular tissues, and that upon the alternate play of these depend the contraction and relaxation, as in the case of the two nerves referred to of the submaxillary gland. This idea would be in accordance with the position that has been taken by some physiologists, that there is an active expansive power in the capillaries, which is in obedience to stimuli. Now if the blood had no other part to perform than mere passage through the vessels, in larger or smaller quantities in proportion to the facility of its flow, this mechanical explanation might be satisfactory, as vital contraction and expansion under the influence of nervous action would be all sufficient. But there are processes and operations to be accomplished in the tissues, which, although dependent on a due supply of blood, consist in the assimilation of its elements, and in elaborating compound materials for the especial use of the tissues; to use the expression, there are vital laboratory operations which are superadded to the capillary circulation, and these are the nutritive, formative, and reconstructive, which maintain the integrity of the tissues or replenish and repair them, and which must depend upon forces *sui generis.* In the present state of our knowledge it is impossible to account for all the reactions which occur in the interstices of the tissues in connection with nutritive and formative acts, or to determine precisely either the molecular attractions which assume definite expression in the production of the compounds which enter into the composition of tissues, or the new affinities which arise in the waste of them. Yet it is apparent that such reactions and molecular attractions are under the influence of a principle that responds to the impression of stimulants, and that they may be increased or diminished, modified, or perverted, when stimulants are preternaturally brought into operation. Organic excitability, which found expression in the organic sensibility and contractility of Bichat, which for so long a time had been ignored by physiologists, has acquired new advocates in the supporters of cell doctrine. In normal life actions the source of stimulation is inherent in the tissues, is inseparable from vitality, and we may name the principle as we choose, excitability, impressibility, or sensibility. With this view of the case, the afflux of blood which follows the application of stimuli to a part may take place irrespective of the nervous system, as also may contraction.

A distinction is to be drawn between the effects of stimulants within the bounds of healthy action and their inordinate operation. There may be excitation of vital activity in a part accompanied with greater fulness of the vessels, with an increase of temperature and all the accompaniments of energy, without disturbance of any of the usual processes which are peculiar to the part, or there may be such modification of nutrition as to lead to an alteration in the structure and physical properties of the part, a positive damage to its constitution. Thus, in illustration, the glow which follows a cold bath, accompanied with heightened coloration of the skin and increase of temperature of the surface of the body, is natural, healthy, and tonic. It must be due, according to the view which has been taken of the operation of stimulants, not only to the impression made upon the extreme peripheral nerves, which is reflected back again to the capillaries, and which likewise arouses the central circulatory apparatus, but there must be an agency for the production of the result in the aroused activity of cell action. Precisely the same effects are induced by other stimulants, as friction, dry heat, or the articles employed to impart force to the local capillary circulation. If the explanation were correct that the nervous system alone is instrumental in such reactive manifestations, the conclusion is inevitable that they are owing to relaxation of the vessels, or to the play between antagonistic nerves, in which case there would be alternate pallor and redness. But the effect is uniform and persistent redness, and to all intents and purposes there is induced in the economy a tonic condition. It is a healthy excitement which is felt in the organs, and which as a therapeutic means is constantly resorted to, not only for the benefit of the part but of the whole system.

Stimulation, however, may be more intense than the production of simple reaction; there may be persistent slight tumefaction with heat and redness. In such case there will exist the parenchymatous exudation of Virchow, with cells unchanged, but fuller of fluid, and a clogged condition. The application of mustard plasters for sufficient time upon the skin, or the low grade of operation with cantharides, may be instanced as illustrative of such stimulation. From the effects just mentioned, which are passing and transitory, to the decidedly disturbing impressions upon nutrition, all grades of operation may be witnessed.

In accordance with the views of Dr. Anstie the genuine effects of stimulation are, 1st. The relief of pain; 2d. Removal of muscular spasm, tremor, or convulsion; 3d. Reduction of undue frequency of the circulation; 4th. Reduction of excessive secretion; 5th. Removal of general debility or special fatigue of the muscles, brain, or digestive organs; 6th. Removal of delirium or maniacal excitement and production of healthy sleep; 7th. Support of the organism in the absence of ordinary food; 8th. Local increase of nutrition where this is deficient. It is remarked by him that the merit of perceiving that most of the above effects can be produced by stimulation better than by any other way, certainly belongs to Brown.

With reference to the relief of pain, there can be no doubt that stimulants are frequently successful. The cases to which this mode of treatment is applicable are asthenic, where, as in the instance of neuralgia, or even pain accompanying an acute disease of low type, the nutritive forces are below the natural standard, and where there is a feeble exercise of the blood-producing function and that fluid is in an impoverished state. Food under these circumstances is an essential element in the treatment, and when aided by such stimulants as alcohol, ammonia, the essential oils, and tonics, as the bitters, quinia, and the preparations of iron, is all potent. In regard to the substitution of the lower portion of the alimentary canal for the stomach in the administration of food, we can speak from experience in the most favourable terms, as upon several occasions it has been most satisfactorily adopted. When the stomach cannot be used, the injection of animal solutions into the bowels affords an excellent substitute for the ordinary mode of nourishment.

When small doses of opium or of chloroform are administered in such manner as to have an effect upon the nutritive processes, it is perfectly true that relief of pain may follow, as represented by the author; but we conceive that the doses mentioned of a grain or two of the crude opium, or one-fourth of a grain of a salt of morphia, would in this climate, in the large majority of individuals, prove the benumber of nerve action and so powerful a modifier of the nutritive operations as to become in the very sense that Dr. Anstie insists upon true narcotics. The accumulation of minute doses results in the same impression.

To define pain by language is an impossibility, and Sir W. Hamilton was as much at fault in this respect as the ordinary compiler of definitions, when he enunciated "that pleasure is the result of certain harmonious relations, of certain agreements; pain, on the contrary, the effect of certain inharmonious relations, of certain disagreements," a sentence that conveys no more idea of the nature of pain than the definition of a musical sound to a deaf mute. Sensibility and perception are involved in the production of pain, but it is distinct from mere pervertion of sensibility; and the idea of it cannot be entertained apart from the suffering entailed by it. The most that can be said in the premises is that a depressed and exhausted state of the vital energies, and a want of due supply of healthy nutritive blood for the maintenance of the organic processes, are predisposing causes of an attack of pain in some part or organ. Were the circumstances alluded to the immediate cause of pain, it ought to be universal and not solely confined to a particular nerve structure, which is no more in a depressed nutritive condition than the whole nerve-working apparatus. We are disposed, therefore, to believe that the fixation of pain is from local causes, and to adhere to the term irritation, indefinite as it may be, for the state which is produced. Stimulants, by promoting healthy action, and tonics, with food, by repairing the waste of the tissues, may be regarded as the surest methods of permanent relief from pain in conditions of depression and exhaustion.

In connection with the removal of pain, the beneficial influence of diffusive excitement cannot be ignored, and this may be accomplished by the employment of the articles under consideration, either internally or externally, in the vicinity of or directly to the part affected.

It has long been understood that "muscular tremor, spasms, and convulsions" can be relieved by the exhibition of stimuli, and hence under the name of Antispasmodics many of them have been introduced as a class into the treatises upon therapeutics. The use of the term is in accordance with long usage and not from any acquiescence at the present time in the peculiar physiological or pathological doctrines from which it originated. It is generally assumed that convulsive movements arise from three causes — reflex action, excitement of the central masses in which resides motive energy, and a disturbance of these masses by influences which produce the effect of modifying, depressing, or suspending nutritive activity. To the latter alone must attention be directed in connection with the employment of stimulants.

It is an observation as old as Hippocrates that "spasm arises from repletion as well as inanition," but the latter fact has been greatly ignored by modern writers. In his "Treatise upon the Venom of the Viper," &c., 1781, Fontana has presented views bearing upon this source of convulsive movements which are worthy of citation at the present time. In connection with the mechanical philosophy which prevailed at the date given, it was supposed that convulsions proceeded from "caustic salts, whose invisible points pricked the nerves and irritated the muscular fibre." In combating this hypothesis, the language of Fontana is the following:—

> "Convulsions are not always the effect of stimulus which irritates; they come rather from this, that the equilibrium between antagonistic muscles is broken. Animals that are weak and languid, and those which die from loss of blood, perish in horrible convulsions, and nevertheless there are neither pointed nor irritating salts. It is still more improper to attribute in these cases the convulsions to a superabundance of animal spirits; on the contrary, it would appear more reasonable to believe that there is a deficiency of them, or an irregular distribution of them to the muscles, or, to speak more correctly, it is to an irregularity in the circulation of the blood that convulsions owe their origin." "If opium causes convulsions it is because it destroys at different times and irregularly the irritability of muscular fibre. It is, moreover, certain that they are the weakest men and the most delicate women who are always most subject to convulsions, and it is not possible to suppose in these individuals a superabundance of animal spirits. It is known that all the muscles, even in relaxation, retain a certain tension in their fibres, which, when cut, invariably shorten and enlarge the wound. When a muscle is paralyzed it becomes elongated, and its antagonist still more is contracted, a fact which demonstrates that repose in muscles depends upon the equilibrium of forces between different muscles and between their different fibres. These forces, thus balanced, are lost and renewed at every moment without producing any movement or any visible change."
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> "But if the muscles do not receive the same quantity of fluid, or if this fluid arrives in them, or is distributed to them unequally, immediately the equilibrium of effort of the muscles is broken, those which receive the fluid enter into contraction, and hence the convulsions and violent throes which agitate the whole machine. Hence those who die of hemorrhage are affected with convulsions, as well as those who perish of poison. For it is certainly not probable that the loss of blood and the loss of force should be in equal proportion in each part, in each muscle, in each fibre, whilst the circulation itself is so unequal, and irrita-

bility does not cease to exist but in an irregular manner in muscles according to times and circumstances."[1]

In these most interesting hypothetical expositions of Fontana is presented the key-note which has helped observing practical pathologists to their conclusions with respect to the conditions of the nervous system which are conducive to convulsive manifestations in the muscular system. For animal spirits, nervous power has been substituted, and the truth has become as clear as any axiom in science, that whatever has the effect of exhausting energy and of interfering with its regular distribution, will contribute to the ready occurrence of convulsive movements. The experiment of Sir Astley Cooper, in this connection, is highly instructive.[2] He tied both carotid arteries in a dog, and compressed the vertebral trunks, when with insensibility convulsions were induced, exhibiting, as Dr. Carpenter remarks, that "the functions of the spinal cord were not suspended but only deranged." It is remarked by Dr. Marshall Hall that "convulsion from loss of blood constitutes one species of puerperal convulsion, and should be accurately distinguished from other forms of this affection arising from intestinal or uterine irritation and an immediate disease of the head."[3] Such teaching was not in vogue at the time he wrote his treatise on the morbid effects of loss of blood, and hence some of the most eminent practitioners were in the habit of bleeding, where loss of blood was the occasion of the trouble. In that form of convulsions attending parturition, preceded by free discharge of albumen from the kidneys and dropsy, it has been the endeavour to ascertain the toxic element of the urine, which by its action upon the cerebral spinal centres is the immediate cause of the convulsive movement. It is by some supposed to be urea (hence uremic intoxication), and by Frerichs to be the carbonate of ammonia formed from it; but the exhaustive process of the discharge of albumen, the very basis of blood formation, has been overlooked, and the fact not considered that by a hemorrhage, as albuminuria to all intents and purposes is, the nervous system is slowly deprived of its normal and sufficient source of nourishment. To this circumstance may be attributed the condition of the nerve centres, which has been termed *convulsibility* (the convulsive tendency), and which only requires the exciting influence of reflex action to call it into operation; or the explanation given by Fontana may be correct, the abstraction of nerve controlling force, by which the equilibrium of muscular tension is maintained, and the abandonment of the muscles to their own inherent contractility. The employment of stimulants, as ether or chloroform, in these cases of exhaustion is productive of salutary results by sustaining the nervous system to the point of its normal functional activity. In such condition the use of stimulant tonics and food becomes the rational method of treatment. In the treatment of epilepsy Dr. Anstie speaks in favourable terms of the use of chloroform in small stimulating doses, or of hot brandy and water, or alcohol in some form, at the time of threatened attack. Carbonate of ammonia has been used by Dr. Reynolds.

The "reduction of unduly frequent circulation" is an important effect of stimulants in certain conditions of the economy. Indeed, in these cases, they are the only remedies which are effective in bringing the circulation to the normal standard. As remarked by Dr. Anstie, "so well known is this effect, that a certain degree of frequency of pulse, varying somewhat according to the observed type of the disease, is very commonly taken as the best indication of the necessity of administering stimulants." The recognition of this fact has been of infinite service to practical medicine, for by the older practitioners no more grievous error was committed than that of supposing in diseases connected with inflammation of organs, a rapid pulse was indicative of the necessity of continuing evacuant treatment, and that inflammation itself was to be treated, to the very end, favourably or unfavourably, by antiphlogistic measures, irrespective of the condition of the general system, and without the idea that in the very reactive phenomena which were presented was the evidence of an exhausted condition of the nervous system. We are indebted to the observations of pathologists and therapeutists of the last thirty-five years for the thread of the labyrinth through which the older practitioners wandered in hopelessness of extrication. To Travers, Gooch, and Marshall Hall are we indebted for the demonstration that the same apparent symptoms are to be met with both in sthenic and asthenic diseases. Such diseases had previously been recognized and studied in their separate states, and had distinct locations in the nosological arrangements, but were not understood in their similarity of manifestation. Call it by what name we may, constitutional irritation, or reaction from exhaustion, the profession is now alive to the fact that all cases of excitement are not to be controlled by the same remedies, and that in the large majority of them the employment of stimulants is the only security for the patient. Every good practitioner must indorse the language of Dr. Anstie with reference to the use of stimulants under circumstances of excitement, to wit: "Here again it is by no means desirable to drench the patient with a large dose; the object should be to administer small quantities at short intervals. For to narcotize a fever patient is a most serious and dangerous step, and the well-meant zeal of those who have desired to procure sleep has often induced coma from which the patient has only recovered to collapse and quickly sink."

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[1] Vol. i. p. 9.

[2] Guy's Hospital Reports, vol. i. Carpenter: Principles of Human and Comparative Physiology, p. 352, Amer. ed.

[3] Researches on Loss of Blood.

The reduction of excessive secretion can be brought about by stimulation. Where inordinate secretion is the result of laxity or feebleness of organic structure, giving rise to exudation or physical exosmosis, stimulants, either locally applied or used internally, to effect a general alteration of nutrition, will be found most efficacious.

There are other morbid states referred to by Dr. Anstie in which stimulants are the most effective therapeutic measures. "The removal of delirium and of maniacal excitement, and the production of healthy sleep where it has been morbidly absent, is an effect of stimuli, which, according to the old ideas of stimulus, would surely have been unreasonable and impossible, and yet it is really one of the most characteristic effects which these agents are capable of producing." The occurrence of delirium or of mania in an exhausted state of the system is now recognized as mere representations of such condition; they are the legitimate symptoms of exhausted nutrition in the brain, and can be produced by any cause which tends to pervert this nutrition, either mental or physical. The overworking of the brain, or starvation, or reduction of the elements of the blood from poisonous substances, will equally proclaim how deeply the nutritive molecular operations of the cerebral substance have been altered. With regard to *sleep*, what Dr. Anstie says is too important to be presented in other words than his own.

"That the brain does become depressed, to a certain extent, during sleep, in as far as this may be judged from its being in a state of *anæmia* or bloodlessness, as compared with its condition in waking moments, is rendered probable by the recent researches of Mr. Durham.[1] But it is certain that there is a more extreme degree of anæmia of the brain, which is absolutely incompatible with sleep of a natural and healthy kind." "It appears as desirable to take as our starting-point the physiology of natural sleep, in order to explain the kind of stimulant action with which we are at present concerned. Natural sleep is that repose of the brain which, in a healthy state of the organism and in the absence of natural hindrance, follows the performance of a certain amount of bodily labour, which has exhausted the nervous system to a certain extent. We may suppose, if we please (with Dr. Durham), that the results of the chemical changes in the nervous matter which necessarily accompany the action of the brain—the *debris*, so to speak—have impeded the continuance of the action by which they were produced, and that a state of comparative anæmia follows, during which the brain is allowed time to repair itself, as we know that it certainly does. Provided that this process of repair can go on properly, sleep is uninterrupted; not that it is a uniform state, on the contrary, as Sir Henry Holland justly observes, 'it is a series of fluctuating conditions, of which no two moments perhaps are strictly alike;' the varieties extending 'from complete wakefulness to the most perfect sleep of which we have cognizance from outward or from inward signs.' It is a state which, as it seems to me, we may best express by supposing the mind to be in perfect vigour, but united to a corporeal instrument, whose efficiency is constantly fluctuating, in correspondence with the interstitial changes by which it is slowly being repaired, but with a steady progress, on the whole, towards recovery."

Where sleep is impossible, or banished by wakeful delirium, it is clear that food aided by stimulants constitutes the necessary means of restitution from the perverted state of nutrition here referred to.

Dr. Anstie's seventh proposition, that "the support of the organism, in the absence of ordinary food, by stimulants, is one of the most remarkable phenomena which can be offered to the attention of the physiologist," is supported by references to the testimony which is given of the wonderful effects of coca and of opium, as well as the sustaining effects of tobacco and alcohol under the exhausting tendency of labour and exertion. The question with respect to these artificial stimulants being of advantage or injury, is one upon which the most astute physiologists have differed. Even under the admission that purely stimulating doses are advantageous, the difficulty of restraint within these bounds is so great that the line of demarcation between useful stimulants and dangerous narcotics is but imaginary. To what extent they may be made *food* under ordinary circumstances, or are transformed into *poison*, has not hitherto been accurately determined. With respect to alcohol, Dr. Anstie regards it as food when employed under the restrictions of pure stimulation, and in this he is in direct opposition to Dr. Carpenter, who regards the operation of alcohol as not subservient to the nutrition of the tissues, but a stimulus, increasing for a time, like other stimuli, the vital activity of the body, but followed by a corresponding depression of power We are inclined to the belief that, upon a review of all the arguments, the position of the latter authority is most tenable. The use and the abuse of alcohol is too prolific a theme for present discussion.

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[1] On Physiology of Sleep, Guy's Hospital Reports, 1860.

The last proposition to which attention will be directed refers to the idea that stimulation is invariably followed by depression. The use of the term reaction in the very reverse sense of that which we are in the habit of attaching to it, we agree with Dr. Anstie in considering erroneous. In depressed states of the system, when stimulants are used, and a favourable impression is made by them, instead of depression, a normal condition is brought about, and this, in ordinary parlance, is called reaction. It is well known to the physician and the surgeon, after the invasion of disease or the occurrence of an accident. But the depression from the use of stimulants, a subsidence of activity, upon no ground whatever can be called reaction; it is depression from some cause inherent in the economy, and with reference to this cause is the issue made between our author and the physiological and therapeutical writers most in estimation.

Dr. Carpenter asserts that "the influence of excitants, repeatedly and powerfully applied to the nervous tissue, is undoubtedly (as in the case of muscle) to weaken, and at last exhaust, its power of responding to them; this is seen alike in experimental researches and in the ordinary course of vital action. The excitability thus exhausted can only be regained by an interval of repose during which the nutritive operations may restore the tissue to its pristine integrity, and thus prepare it for renewed activity."[1] Upon turning to the pages of Muller,[2] we find the following statement: "The action of an organ being excited by stimulants, and every increase of action without simultaneous increase of organic force being attended with exhaustion of this force, stimulants themselves must exhaust, or, as it were, consume the organic power; and unless, like the general *vital stimuli*, they have at the same time a restorative action, a temporary cessation of the action they have themselves excited will follow, although their influence be continued." The belief thus ennunciated rests further upon the ground that nerves and muscles, when stimulated by galvanism, by mechanical or other agents, lose their capability of excitation, and require repose before the same phenomena of vital activity can be brought about. Convulsions are suspended from exhaustion of the excitability, either in nervous trunks, or more probably in the muscular fibres, and we have seen temporary paralysis of one side to follow convulsions confined to that side, which by a few hours' rest was completely removed. It is admitted by Virchow that "in all parts certain states of fatigue manifest themselves, states during which the part is no longer able to originate the same amount of movement that up to that time could be perceived in it;" but while Dr. Carpenter attributes the restoration of excitability and removal of depression to the renovation of nutrition, Virchow assumes that "in order that they may again become competent to perform these functions, these parts by no means always require a new supply of nutriment, a fresh absorption of nutritive material; rest alone is sufficient to enable them to resume their activity in a short space of time." To the doctrine of depression following stimulation, exception is taken by Dr. Anstie. He asserts directly that "it is not true that stimulation is of itself provocative of subsequent depression;" and further states: "We often hear the effects of strong irritation of the skin or the mucous surfaces quoted as an example of the way in which action and reaction follow each other. The immediate effect of such treatment (it is said) is to quicken the circulation and improve the vital condition of the part; but its ultimate result is a complete stagnation of the vital activities in the irritated tissues. The real explanation of the matter is, however, very different from this. Mild stimulation of the skin (as by friction, warm liniments, &c.) has no tendency to produce subsequent depression, nor has mild stimulation of the mucous membranes (as the mustard we eat with our roast-beef). But the application of an irritant strong enough to produce a morbid depression at all, produces it from the first." According to him, "a stimulus promotes or restores some natural action, and is no more liable to be followed by morbid depression than is the revivifying influence of food."

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[1] Carpenter's Principles, p. 382.

[2] Elements of Physiol., vol. i. p. 59.

There can be no doubt, that where stimulants are used in sufficient quantity to perturb nutrition, that proportionate to this disturbance will be inability to maintain the usual functional or organic operations of the organs or tissues; and that the vital processes may be disorganized from the first impression. The mode of operation, however, is not stimulative, it is narcotic.

But where stimulants exercise their legitimate mode of operation, by maintaining activity of the functional and nutritive acts, can this effect be sustained indefinitely without depression? The nutritive acts are dependent upon stimuli, with a capability of responding to these stimuli in the interstices of the tissues. With the supply of material in the shape of food, the molecular movements go on uniformly, with all the changes necessary for repair and waste. The distribution of nervous force and of capillary circulation are, as has been shown at a preceding page, internally connected with nutrition. Stimuli occasion action and not power; where they produce the latter it is by an improvement of nutrition, and this requires accessory materials. Now, whether nutrition depends upon the mere play of physical forces, or is maintained by them in connection with vital susceptibility, as the production of action is the effect of stimuli, it follows that mere action, without the due supply of materials for assimilation, must ultimately result in waste of tissue and corresponding exhaustion of vital force.

The term excitability of a part is the mere expression of a capability in that part of responding to impressions, and exhaustion of the excitability only means that the capability is lost, so far as can be judged from outward manifestations, and as has been seen, if stimuli occasion action without recuperation by the supply of requisite materials for nutrition of a tissue, it is a mere choice of words to express a result—exhaustion of excitability or damage to nutritive operations. As excitability is dependent on proper nutrition of a tissue, the operation upon it by stimuli, by the very waste of materials, is an exhaustion of the excitability. The continuance of application of unusual stimulants, for a long period, to the tissues or to the system generally, even in small quantities, which at first do not produce disorganizing effects, are calculated to exhaust the vital operations, and ultimately terminate in depression. In the light in which we have viewed the subject, it would appear that the views of Dr. Anstie and of the physiologists mentioned, are not so far removed from each other as might at first sight be supposed.

In the preceding exposition we have endeavoured to present the account of the views which are entertained at the present time by eminent physiologists, with respect to the operation of stimulants, and are greatly indebted to Dr. Anstie's book for clear statements and reasoning upon this interesting subject. His opinions are well illustrated and sustained by ingenious reasoning, yet are open to criticism and objections, and, as has been shown, some of his statements are in opposition to the views of the deepest thinkers in the profession.

The other class to which Dr. Anstie's work is devoted is that of *Narcotics.* After presenting the views of the ancients with regard to the substances which may be included under the head of narcotics, and exhibiting that a great degree of confusion existed with regard to the effects of articles and a confounding of many entirely dissimilar, Dr. Anstie remarks that it is time to restore the word narcotism to its true and original signification; "for, in the present state of our knowledge, we shall hardly find a better definition of narcotics than that of *deadening agents, which diminish the activity of the nervous system.*" The word ναρκωτικος was coined by Galen (whence our narcotic) to signify an agent which acts "by extinguishing or repelling the native heat and animal spirit, without which feeling is impossible."

Dr. Anstie does not admit the propriety of separating, as is now usually done, *narcotics* from *sedatives.*

> "The one difference which would seem to stand out at all prominently as a distinctive mark, separating sedatives from narcotics, is the sudden and *shock*-like manner in which the former depress the system when given in a very considerable dose. Prussic acid and tobacco might be taken as typical examples of agents which are capable of occasionally producing this sort of effect, but neither of these substances is devoid of the power of stimulation when administered at a proper time and in a suitable dose. And, on the other hand, it is certain that opium, which was selected by Brown as the most perfect example of a diffusible stimulant, has not unfrequently produced precisely that sudden depression which should result only from the action of a sedative."

There are two ways in which an impression is made upon the heart by narcotics: 1. By a depressing influence on the brain of such an overwhelming character as to resemble the violence inflicted by a blow which completely crushes the head; and 2. By the rapid production of a change in the organic nerves of the heart itself through the direct action of poisoning blood upon them.

All physiological and pathological observation has taught us that narcosis is a condition in which the nervous system is especially involved, and that the phenomena presented largely represent the suspension of activity of this system. This must be accomplished in two ways—by an introduction of a narcotic into the circulation, and "the agency of a poisoned blood supply" upon the central nervous masses, and the interruption of their vital functional activity, whereby perceptive capability and motive power, for reflex purposes, are interfered with; or, 2dly, by a local interruption of conducting power in nervous-cords, by which a severance is made in the communication between organs and their regulating centres. Narcosis, therefore, "is in fact a more or less complete paralysis of the nervous system." If the brain and nerve centres are in this state of complete or partial paralysis, the mandates of the will or even the response to the calls for aid in the performance of functional acts in the organs cannot be given, while if the peripheral termination of the nerves or the communicating cords are in a benumbed or anæsthetic state, a perfect isolation of organs or tissues is effected. The state which is then presented is a *negative* one, and is entirely in opposition to that of stimulation, which is *positive.* If stimulation is active, narcosis is passive, and herein resides the difference between the two in their manifestations. Stimulation may proceed from the nerve centres to the organs under their control, or it may be brought about by the impression upon the peripheral sensitive nerves and be reflected; while, although nerve influence may be abstracted from the organs by the obliteration of nervous activity in the centres by narcotics, the local application of the latter being confined in its effects to the part to which it is applied, will not be followed by an influence on other parts or organs. The local benumbing or paralyzing effect is passive, and passive effects are not communicated by nervous transmission. We can from this understand that a local anæsthetic effect can be produced without involving other parts or organs than the one affected.

While narcotics interrupt vital actions in the brain and spinal marrow, in the ganglions or the nerves by the damage which is done to the nutritive operations, the effect upon the same operations in the tissues themselves must not be overlooked. If the doctrine of independent cell activity be admitted, whether narcotics act upon the vital excitability or upon the mere operation of physical forces, there is a broad field of conjecture and of research. That nutrition in the tissues is modified by sedative poisons, has been demonstrated by the experiments of Drs. Hammond and Mitchell, published in this *Journal*, July, 1859. The articles introduced into the circulation were Caraval and Vao, two varieties of the poisons of the South American Indians. "It was found that the motion of the heart was *primarily* checked from the introduction of these substances into the circulation, and that there followed upon it paralysis of the limbs and loss of voluntary motion, but reflex action remaining for some little time afterwards." By preventing the agents from entering a limb its full excitability was maintained. It may be argued with respect to like poisons that as the deadening of the heart takes place in a short period, it affords evidence of the capability of the poison to forcibly act upon the muscular tissue, and that while entering the heart and being distributed through its interstitial structure, a certain amount is carried to the brain and spinal marrow, and also to the remote muscles. But as the heart speedily ceases to act, the full dose cannot be driven into other organs and portions of the body, and consequently entire loss of vitality is delayed until the complete effects of deprivation of blood or its perversion, as is manifest in these cases, are felt in every tissue.

Although Dr. Anstie has put his case in plausible language, we do not think that the medical world are sufficiently advanced in a knowledge of the intimate causes of vital actions to do away with the general terms of sedatives and sedation any more than to dispense with those of stimulants and stimulation. The phenomena connected with narcosis are to be studied with reference to the nervous system of relation and the organic system. At the head of the list of effects upon the first named system are those upon the brain. Dr. Anstie regards the symptoms which have been looked upon as indicating excitement in connection with intoxication to really mean narcosis, which he illustrates by a detail of cases, and by reference to what may be termed the literature of drunkenness. The commencing conditions are connected with loss of the reasoning faculty, and the termination, partial or total loss of consciousness, intermediate to which are diminution of the moral sense, of the power of voluntary recollection, prominence of the emotional and appetitive instincts, and delirium, involuntary memory, and involuntary fancy.

The disturbances of sensibility include delusive feelings of heat or cold, partial numbness, formication, painful tingling or actual continuous pain, indistinctness of the sense of touch, perversions of the other special senses, actual paralysis of common sensation, in most instances commencing with the posterior (lower) extremities.

The muscular affections include chronic convulsions, tremor and shudderings, spasm, tetanic convulsions, catalepsy, and motor paralysis. The changes in the pupil would come under this category.

The alterations of respiration include undue frequency, undue slowness, gasping, sighing, labouring, or spasmodic respiration.

The symptoms which concern the organic system are connected with the heart, with too great frequency and abnormal feebleness, undue frequency with undue force, undue slowness with abnormal feebleness, irregular rhythm with abnormal feebleness.

And, what more particularly concerns the nutritive processes, disturbance of secretion.

In the preceding review we have so far exceeded the bounds originally proposed that we cannot go into an illustration of the various points above enumerated; the reader is referred to the book which has been taken as the heading of this article for full details upon each one of them. The prominent end we have had in view, in connection with the exposition of Dr. Anstie's views, is a statement of the opinions entertained among physiologists with regard to the interesting and important subject of stimulation and sedation. We must here close the discussion.

Connected with this treatise are several essays detailing the results of experimental inquiry with respect the action of special stimulants and narcotics. To do justice to these would require as much space as has been already occupied, and they can only be adverted to as important and extremely interesting. J. C.

ART. XIX.—*Laryngoscopy.*

1. *The Use of the Laryngoscope in Diseases of the Throat, with an Appendix on Rhinoscopy.* By MORELL MACKENZIE, M. D., etc. Philadelphia: Lindsay and Blakiston, 1865. 8vo. pp. 160.
2. *Rhinoscopy and Laryngoscopy, their Value in Practical Medicine.* By Dr. FRIEDRICH SEMELEDER, Physician in Ordinary to His Majesty the Emperor of Mexico, etc. Translated from the German by Edward T. Caswell, M. D. With wood-cuts and two chromo-lithographic plates. New York: William Wood & Co., 1866 8vo. pp. 191.
3. *Die Inhalations-Therapie in Krankheiten der Respirations-Organe mit besonderer Berücksichtigung der durch das Laryngoscop ermittelten Krankheiten des Kehlkopfs.* Von Dr. GEORGE LEWIN, dirigirendem Arzte in der Königlichen Charité ad interim, etc. Mit 25 Holzschnitten. Zweite vermehrte und verbesserte Auflage. Berlin: Hirschwald, 1865. 8vo. pp. 506.

   Inhalation Treatment of Diseases of the Respiratory Organs, with Special Reference to the Diseases of the Larynx as made known by the Laryngoscope. By Dr. GEORGE LEWIN, Attending Physician to the Royal Charité ad interim. With 25 wood-cuts. Second enlarged and improved edition.

WE have placed these titles at the head of our article, not with the intention of reviewing the individual works, but rather as a text for the consideration of laryngoscopy from a practical point of view, both as to its aims and to what it has accomplished. But a short time ago, Gibbs's work, reviewed in a former number of this journal, was the only one that our language could boast of. We now have four or five publications by English laryngoscopists and one translation. Our journals now frequently contain notes of cases in which the laryngoscope has been employed, and we think the tendency is to acknowledge the great benefit which has accrued to medical science from its introduction. Its legitimate position is recognized, and its claims undeniable. Notwithstanding Dr. Watson's opinion in the *Lancet* for October, 1865, we maintain that the laryngoscope does reveal to us many facts which we could never know, *ante mortem*, without it. Any one who is familiar with the use of the instrument, and who has had opportunities of observation, will recall numbers of cases in which it was impossible to have formed any definite idea of the existing conditions without the aid of this instrument. Who would arrive at the diagnosis of a laryngeal polypus, of laryngeal tumours in their initial condition, of malformations, or of paralytic conditions of the chords, without this instrument? And who too may not be misled in cases of aphonia, and infer the existence of organic and structural changes, where the laryngoscope would reveal to him the normal condition of the vocal organs? There is then something positive in the information we derive from its use; there is an undeniable benefit which it confers upon us. It shows us directly what would be but inference without its aid. Then again, as Dr. Watson admits, it certainly is a valuable aid in confirming our diagnosis in other cases where we have been able to arrive at a pretty definite conclusion without it, but still not so definite as when it is brought under our own eyes. Its mission here is merely to confirm, and is therefore secondary to the one which we have mentioned, that of giving positive knowledge which could be gained in no other way. Its third sphere of usefulness is in the facility it affords of making local applications and of applying surgical treatment to the larynx. That there is ground for the opinion that the laryngoscope may lead to too frequent and to unwise surgical interference must of course be admitted, but it seems to us by no means probable. It is with it as with every other instrument; in the hands of prudent, enlightened men, it is a source of great instruction, an agent of great importance; in the hands of ignorant, fanatical men, it may become the cause of much injury. Dr. Watson's holy horror at the use of cutting instruments, within the cavity of the larynx, is rather surprising in the face of the scores of cases now recorded, where polypi and other tumours have been thus removed, and where entire recovery has rewarded the skill and patience of the laryngoscopist.

Mackenzie has given the most complete history of the laryngoscope that has yet appeared. Although laryngoscopy is considered a new branch of medical science, yet the first attempts at an examination of the throat and air-passages, worthy of the name, were made more than fifty years since by an Italian named Bozzini. It was not, however, until thirty years thereafter that any definite and decisive result was reached, and then it was due to Dr. Babington, of England. He seems to have been the first who really used this method of exploration, but his instruments were clumsy, his mode of conducting the examination unsatisfactory, and his observations were never recorded. Subsequent to that period numerous attempts were made at different times in England, France, Italy, and even in America, to gain a view of the interior of the larynx. Mr. Liston seems to have been successful in exhibiting the parts above the vocal chords, that is, the *aditus laryngis*. Garcia, the celebrated vocalist, was led from curiosity to devote much attention to the subject, and he applied himself with great zeal to the study of his own vocal organs; he, however, limited himself to the study of *auto-laryngoscopy*, being the first who had ever practised it. In this country, so far as we are aware, the only attempt to explore the regions beyond our natural observation, previous to the introduction of the laryngoscope as it now is, was made by Dr. Cutter, of Woburn: he devised a sort of speculum, curved and furnished with a prism, by which he hoped to accomplish the object, but the attempt was unsuccessful. It was left for Czermak, then Professor in the University of Pesth, to utilize all the experiences of others, and produce the perfect instrument as we now have it.

Let us see what the instrument is, and what it is to accomplish. In order to "look round the corner," as one of the old writers expresses himself, it is only necessary to have a mirror so placed that it shall command the view round the corner, and to throw light upon that mirror. The corner that we have to look round is the epiglottis and the base of the tongue. The axis of the larynx and trachea is not at right angles with the horizontal plane of the mouth, but inclined so that it forms with that plane anteriorly an acute angle. To gain a view therefore of this axis and of all that lies around it, we must hold the mirror perpendicular to it. It is by the simple law of optics—the angle of incidence is equal to the angle of reflection—that we are enabled to accomplish our object. But now how are we to throw light enough upon the mirror to illuminate the dark passage? Czermak's predecessors had all availed themselves of either direct or reflected sunlight. Either of these is, of course, ample for all purposes of observation; but if direct sunlight is used, it can be only when the sun is so near the horizon that the rays of light shall fall directly upon the mirror held in the pharynx. Whether we employ the reflected or the direct ray, all our observations are subject to the chance of the passing cloud, and fair weather alone would be propitious to our investigations. By a happy thought Czermak determined to employ artificial light, and by means of a concave reflector to throw such a cone of light upon the mirror as should be sufficient at all times to illuminate the larynx. Thus by introducing mirrors of a more convenient size, shape, and mounting, and by applying artificial light, he made laryngoscopy valuable at all times and seasons. But this was but the beginning of his work. Starting from this point with the most indefatigable perseverance, and the most admirable skill, he devoted himself first to the study of his own vocal organs, and then to those of others. He worked out the whole anatomy and physiology of the larynx, as it had never been done before; he studied its pathological conditions, and led the way in those investigations, which a few have zealously followed with admirable results.

From what has been said it is evident that the three elements of a laryngoscopic examination, as now generally conducted, are the mirror in the throat, the reflector, and the light. In all these points simplicity should be aimed at; the more complicated an apparatus, the more difficult it is in itself to manipulate, and the more certain is it that but few will endeavour to use it. Hence for the light almost any lamp of sufficient size, that will give a clear, steady flame, will answer. A movable gas light, furnished with an argand burner, and strengthened by a glass reflector, affords a most excellent light. Störk, of Vienna, has used glass globes as reflectors, but the glass reflectors spoken of have acquired quite a reputation abroad, and are known as the American reflector. The concave reflector used in the examination has a diameter of three-quarters of an inch and a focus of eight-tenths of an inch. It is also perforated in the centre, so that the eye can gain the full force of the reflected cone of rays. The mode of using this reflector has been various. Czermak himself has it fastened to an upright metallic staff, which is fitted to a horizontal wooden handle, and this he holds between his teeth. Semeleder has attached it to a spectacle frame by a universal joint upon the bridge. It has also been applied to Cramer's forehead band, and when thus used it may or may not be perforated, according as it is intended to be used upon the forehead alone, or upon the forehead or over the eye. When used upon the forehead it is open to the objection that the light falls upon the mirror in the pharynx at a different angle from that at which the observer's eye is placed. Tobold has applied it to the end of a jointed bracket, which is attached to the standard of the lamp, and to the latter he has added a system of lenses for the purpose of concentrating the light. The third factor in the examination is the pharyngeal mirror; these may be round, ovoidal, square, or rectangular, and may be of glass or steel. For ordinary purposes the round ones are the best, and those of glass are preferable to those of steel. Whichever may be used, a variety of sizes will be necessary, ranging from half an inch to an inch in diameter. They are plane mirrors, attached at an angle to a metallic stem, which is fastened into a wooden handle by a screw.

If now we wish to make an examination, we must seat our patient at a table with the light on a level with his mouth, and a little behind him. It is better for the observer to sit upon a low stool, so that his eye will be at the height of his patient's mouth. Many of the writers lay no stress upon this point, but we think it will be found to facilitate the examination. The reflecting mirror must then be adjusted, so that it will throw the light upon the patient's mouth. In order to let the light fall upon the mirror in the pharynx, and from thence into the larynx, the patient's tongue must be kept protruded, and for this purpose it is only necessary that it should be slightly held in a napkin by his own finger and thumb, or by the observer's. All the instruments that have been devised for holding the tongue, &c. &c., such as tongue depressors, self-holders, epiglottic pincettes, and head rests, are needless accessories, inasmuch as while they tend to intimidate the patient, the result gained by them may generally be obtained by training. The small mirror must then be introduced, but it must previously be warmed in order to avoid the effect of the vapour upon its reflecting surface; the handle of the mirror should very nearly correspond with the angle of the mouth. The mirror should be introduced as quickly as possible, passed under the uvula, and carried back to the wall of the pharynx, thus causing the least amount of irritation. During the examination the uvula lies upon the back of the mirror, which should be held at an angle of about 45° with the horizon. Care must also be taken in introducing the mirror, that its reflecting surface is not brought in contact with the tongue. Such is the manipulation, but simple as it seems, it is in many cases very difficult to accomplish. According to Dr. Semeleder's experience about five in a hundred are by nature incapable of being examined; with about twenty-five in the same number the examination succeeds at the first attempt, and in the remainder it will be successful after a few trials.

Let us, however, consider what are the chief obstacles to a successful examination. Of course the age of the patient is important. With children it is very difficult to accomplish even after long practice. But aside from the fact of age, we find other and oftentimes serious impediments in our way. In the first place, the body of the tongue itself sometimes presents the greatest obstacle. Even when it is drawn out of the mouth, it will still rise up in the middle to such a degree as to entirely cut off from view the soft palate. A case came under our eyes quite recently in which it was utterly impossible to gain a glance at the mirror, so prominent was the tongue. This circumstance cannot be overcome by the use of the spatula, for that would press the root of the tongue down upon the epiglottis and thus close the very channel which we are trying to expose. The only method of overcoming it is to train the patient by a sort of lingual gymnastics to press the tongue down at the same time that it is pushed forward. Many auto-laryngoscopists acquire this muscular control to such a degree that they do not protrude the tongue at all, but keep it pressed forwards and downwards in such a manner that the entire channel is exposed. The next difficulty is the extreme sensitiveness of the uvula and soft palate. This, as has been said, may be overcome by practice, or, in very extreme cases, it may be in a measure overcome by the use of local anæsthetics, such as ice and solutions of chloroform and glycerine, or morphia and glycerine. Having accomplished this much, we may still be baffled in our efforts by the angle at which the mirror is attached to the stem. This stem is in a measure flexible, and can therefore be accommodated to such variations. But a more serious obstacle is that of the pendency of the epiglottis. This is by no means a frequent occurrence, but still one that sometimes meets us. From some cause, whether as congenital peculiarity, or as the result of a developed laxity of the fibres, the epiglottis, instead of standing erect, is so far inclined over as to cut off, more or less completely, the view of the larynx, and in some cases to render the examination entirely impossible. We have met with one instance of this kind, where the epiglottis was so low that no view of the vocal chords could be obtained.

Having thus given a sketch of the instrument and the method of conducting the examination, let us look one moment at the image reflected in the mirror. In the first place we have the whole of the back portion of the tongue with its papillæ, and its ligamentous attachments to the epiglottis, with the spaces between them. We then see the free edge, and a portion of the posterior surface of the epiglottis. On either side are the spaces between the larynx and the lateral walls of the pharynx. Then looking into the larynx we have the mucous folds that connect the epiglottis with the arytenoid cartilages, and covering the small cartilages of Santorini and Wrisberg. Then we see the arytenoid cartilages with their processes, which give attachment to the vocal chords, and the mucous bands, which connect these two cartilages. We have the mucous chords, falsely denominated superior vocal chords, falsely because they take no part in the formation of the voice, and hence are in no sense vocal chords. The name of ventricular chords seems to us preferable. Below these we see the ventricles of the larynx, and then the true vocal chords.

We would especially draw the reader's attention to the action of these chords, a phenomenon which was never witnessed until Garcia made his experiments, and never clearly understood until Czermak prosecuted his researches. In all ordinary quiet respiration these chords move backwards and forwards towards the middle line. In utterance the posterior extremities are closely approximated by the turning movement of the arytenoid cartilages, and drawn towards each other in their whole length, a little chink only being left midway. In the production of an ordinary musical sound this chink seems like a longitudinal slit; but if a falsetto tone is made, the chink assumes an elliptical shape. Nothing can be more interesting than the first view one has of this phenomenon, and of the mechanism of the human voice.

But to return to the parts exposed to our view. We have said that a portion of the posterior surface of the epiglottis is visible. When, however, a very high note is forcibly struck and held, the epiglottis is thrown upwards more than it is ordinarily, and a still larger portion of the same surface is exposed, with a protuberance, which was not known until the days of laryngoscopy. Mackenzie designates it as the tubercle of the epiglottis. It is a sort of cushion which fits down into the top of the glottis, and renders it more perfectly tight in the movements of swallowing. Below this we can see the anterior attachment of the vocal chords, a portion of the anterior wall of the thyroid cartilage, the anterior portion of the crico-thyroid ligament, the anterior wall of the cricoid cartilage, and then a greater or lesser number of tracheal rings in their anterior portion with the connecting ligaments. Some have succeeded in seeing down to the bifurcation of the bronchi, but it is only under highly favourable circumstances that this can be accomplished.

Such is the field of view that is exposed, not that every one could see all that has been named, nor that any would be likely to see it all the first, or the second, or the third time that he made use of the instrument. For it does require long continued practice, and we are not all gifted with the same amount of skill and dexterity. Nor can all this be seen by one position of the mirror, but a change of position will bring it all into the field of vision.

The first requisite is to get the manipulation of the instruments, and this may be gained by practice upon the phantom or upon such individuals as will submit themselves to the examination. The second, is to learn what it is that is seen in the mirror—to train the eye. When one first looks into the ophthalmoscope, the fundus of the eye seems naught but a red ball, and it is only after repeated trials that one is enabled to discover the papilla optici, with its arteries and veins, the macula lutea, and the vessels of the choroid; so is it in a measure with the laryngoscope. Let no one, therefore, be disheartened if his earliest efforts fail to show him anything that he can recognize.

The best and most ready way of becoming acquainted with the field of observation, is to experiment upon one's self, to practise auto-laryngoscopy. For this purpose it is only necessary to have a plane mirror—an ordinary toilet mirror, or even a piece of looking-glass—held before the face, with the light arranged so as to fall upon the mirror held in the mouth. Or if the concave reflector is used, let the light be thrown from that upon the mouth of the observer's own image just as it would be thrown upon the mouth of a patient. The writer has been in the habit of using the apparatus which Czermak devised for this purpose, and with it he has been more than satisfied. It consists of a horizontal brass rod to which an upright rod is attached bearing a concave reflector, similar to the one already mentioned. This reflector is perforated so that a second observer can make the examination at the same time, thus combining demonstration with auto-laryngoscopy. Another upright rod, in front of the one mentioned, has a small plane mirror in which the observer can see his own organs. The light is placed a little behind the observer's shoulder, and the concave reflector so adjusted that the light shall fall upon the mirror, which is held in the observer's mouth. The image thus formed is seen by the second observer through the perforation in the reflector, and thrown upon the plane mirror before the observer's own eyes.

There is one fact which may at first cause a good deal of trouble, and that is the inversion which takes place according to the known laws of optics, in the reflected image. That which is anterior and below in point of fact, becomes posterior and above in the mirror; thus the epiglottis appears in the upper portion of the mirror and the epiglottis in the lower. There is no lateral inversion, there can be none, and yet many writers refer to this point again and again, and perpetually remind the reader that what seems to be upon the right is really upon the left, thus rendering obscure that which, in itself, is perfectly plain. When the reader stands face to face with a person, the left hand, and so also the left vocal chord, of the latter is upon the reader's right. The left vocal chord remains perpetually upon the observer's right, no matter whether we regard the parts *in situ*, or in the inverted image in the mirror. So too in all cuts of laryngoscopic figures the left chord is as a matter of course upon the reader's right, the parts being inverted merely in the manner above mentioned. If this point still seems obscure to the reader, a simple experiment will demonstrate it to his satisfaction. Let him take a tube and insert a disk which shall represent the rima glottidis, making some distinguishing mark upon either one of the vocal chords. Then holding the tube in the position of the larynx, as it would be in a patient under examination, and using the mirror he will observe the antero-posterior inversion, and the absence of all lateral inversion. There is therefore no *seeming* change of sides.

Leaving now the consideration of the instrument in itself, and of its manipulation, let us procced to consider some of the practical results derived from it. The instruments that have been devised for the application of remedies locally are very numerous, and adapted to the use of all substances from the solid caustic to the finest spray. There is scarcely a laryngoscopist that does not bring forward some new instrument specially fitted, as he thinks, to meet some important want. Looking at it from this point of view, one might well share with Dr. Johnson his fear that the larynx would now become the subject of over-medication. The application of the solid caustic is certainly made feasible, and is only subject to the restriction which all cutting instruments share, viz., it should never be used by a beginner, nor until the surgeon has practised sufficiently upon the phantom to enable him to touch definitely and accurately any point he may select. Tobold suggests that practice should be gained by attaching a prepared larynx to a standard upon which a skull is fastened, thus approximating, as closely as possible, the natural relation. In the hands of a skilful operator, therefore, we maintain that the solid caustic is an agent by no means to be shunned. If it be true, as Watson suggests, that in making use of Gibbs's full-bellied camel's-hair pencil it is impossible to employ the mirror with any advantage, it is nevertheless true that we can afterwards determine whether our application has reached the desired spot. So, too, with regard to the application of pulverized substances, and of spray; the laryngoscope shows us what the necessities of the case are, and whether they have been satisfied. These various methods of treatment are dependent upon the fancy of the practitioner, and the same diseases are treated in these different methods by different men. The treatment by inhalation is, however, still on trial before the medical public.

Lewin's volume is a most comprehensive treatment of the whole subject, giving in detail the results of experiments to prove that the substances thus inhaled do actually pass into the air-passages, even into the smaller bronchi, and establishing the fact that in spite of the large amount which is lost upon the face, and within the cavity of the mouth, enough still enters the larynx to produce positive therapeutic effects. The various kinds of apparatus that have been devised, and the different principles upon which they depend, are fully set forth, together with the medicaments to be used, and their special indications. The second part of the work, which is especially noteworthy, presents in detail the laryngoscopic appearances in various diseases of the larynx. We apprehend that the treatment by inhalation will be found most valuable in some forms of aphonia, in acute and chronic catarrh, and perhaps in croup and diphtheria. Many pages are devoted to the consideration of diphtheria and its treatment by this method. The remedies chiefly employed were tannin, alum, and the *liq. ferri sesquichl.* Although the author does not mention the permanganate of potash, still from its acknowledged antiseptic properties, we think that it might well deserve a trial. For ulcerations in the larynx, the application of powders and of liquids is desirable, but they are still open to the objection that in either case the medicament is scattered upon the sound as well as the unsound tissue. The application of the solid caustic of course obviates this difficulty, but, as we have said, none but an expert and facile operator should undertake its use.

If there is any one department in which laryngoscopy may claim for itself the highest consideration of the profession, it is in the diagnosis and removal of laryngeal polypi. Dr. Watson speaks with something of a sneer of the fact that so many laryngoscopists now discover polypi, while Dr. Green at the time of the publication of his work had seen but four cases. However true the latter fact may be, it is but a fact of experience. One very probable reason why polypi were not more frequently recorded prior to the days of laryngoscopy, may be that they were not sought after. At all events the records are clear and explicit, that scores and scores of cases of laryngeal polypi have been discovered, and have been removed by the aid of the laryngoscope. Here, too, each laryngoscopist seems called upon to devise an instrument for himself, and so we have, *e. g.*, Von Brun's forceps, Semeleder's sickle-shaped knife, and Mackenzie's knives, which seem to bear a very close resemblance to those made by Leiter, of Vienna. In this country resort is still had to laryngotomy for the removal of these growths, but we think the day is not far distant when this operation will in such cases be the exception, and the removal *per viam naturalem* the rule.

There is one point in diagnosis in which the availability of the laryngoscope is particularly shown, and upon which evidence is accumulating. We refer to the diagnosis of tumours pressing upon the recurrent laryngeal nerve, and thus giving rise to an alteration in the voice. These may be of aneurismal origin, as of the arch of the aorta, the laryngeal symptoms being among the earliest manifested, thus enabling the laryngoscopist to make a correct diagnosis while as yet other indications are wanting. Semeleder has reported one case of this kind, Türck reports one, and Lewin one or two. The laryngoscope in such cases reveals a paralytic condition of one vocal chord, while the other responds readily to the movements of respiration and phonation.

Lewin has reported two or three interesting cases, where one vocal chord shut over the other, in consequence of an unsymmetrical position of the arytenoid cartilages, and in two of these the cartilages themselves overlapped. Hoarseness and a harassing cough were the manifestations of this condition. In one case the patient found great difficulty in uttering certain combinations of letters, such as *fr*, *br*, *dr*, at the commencement of a word. Without the laryngoscope it would have been impossible to arrive at the diagnosis of these cases, and the patient would probably have been tormented by useless medication.

Another point in which the laryngoscope is of paramount importance is in the discovery of foreign bodies within the cavity of the larynx, and here its negative testimony is no less valuable than its positive. Frequently persons come to a surgeon with the impression that they have swallowed pins, which they think remain in the larynx. In such cases the laryngoscope will generally determine the fact, and, if the pin is present, will facilitate its removal. Dr. Gibb recently reported a case in which a sixpence was lodged in the larynx, and removed by forceps, with the aid of the laryngoscope. At one of the December sessions of the Royal Medical Society in Vienna a case was presented in which a glass bead had been swallowed by a child four years old, and had lodged in the ventricle of the larynx. The surgeon, who presented the case, stated that no trace of it could be seen with the laryngoscope. Laryngo-tracheotomy was performed, and the bead found in the ventricle. It was as large as a pea, and had a stem of one line in length. Störk, a Vienna laryngoscopist of large experience, doubted the possibility of such an occurrence, and thought that such an object could not be wholly concealed even in that situation. We must confess that we share the doubt with him, and think that a more careful examination must have revealed its presence. A sufficient number of cases are, at all events, on record, to prove that the laryngoscope does enable us to detect the presence of foreign bodies, and to remove them without the operation of laryngotomy.

In conclusion, we would merely refer to the fact that galvanism has been applied locally to the vocal chords, and with apparent benefit in some cases. Mackenzie reports two cases of this kind. He has devised an instrument well adapted to the purpose of applying the galvanic current. We have no doubt that it may be used with advantage in those cases of aphonia where no assignable cause can be detected, and where there is a manifest sluggishness in the action of the vocal chords in ordinary respiration.

C.

BIBLIOGRAPHICAL NOTICES.

ART. XX.—*Transactions of American State Medical Societies:—*

1. *Transactions of the Medical Society of the State of New York for the Year* 1865. 8vo. pp. 376.
2. *Transactions of the Twentieth Annual Meeting of the Ohio State Medical Society, held at Ohio White Sulphur Springs, June* 20, 21, *and* 22, 1865. 8vo. pp. 79.

1. THE *Transactions of the Medical Society of the State of New York* for the year 1865, open with the annual address of the President, Dr. FREDERICK HYDE, of Cortland, the leading theme of which is "Medical Education"—the proper preparation for an entrance upon the duties and responsibilities of a practitioner of medicine. The views advanced by Dr. HYDE are in the main sound and perfectly practicable. The subject of medical pupilage receives, as it well deserves, a prominent and especial consideration. As is well remarked, there are considerations connected with the relationship between the medical pupil and his preceptor—the faithfulness, especially, with which the duties of the latter are fulfilled—which have a most important bearing upon the character and efficiency of the entire after-course of medical instruction.

The first of the scientific papers treats of "The Importance of Examining the Condition of the Dioptric Media in some Affections of the Eye," by Dr. C. A. ROBERTSON, of Albany. The remarks of the author apply more especially to the causes of short-sightedness and other defects of vision, and the relief of these by the use of properly adapted glasses. The subject—a most important one—is ably discussed.

The paper which follows on "The Uses and Abuses of Tenotomy in Cases of Muscular Atrophy, with the true Indications for its Employment," is by Dr. C. F. TAYLOR, of New York. With the exception of those deformities which are directly traceable to scrofulous affections of the bones and joints, Dr. Taylor refers nearly all the remaining deformities of the lower extremities, including congenital club-foot, to the effects of paralysis of certain muscles. "That congenital club-foot is actually the result of an intra-uterine paralysis, is, according to Dr. T., sufficiently proved by the fact that much the larger number of club-feet occur in childhood, as a usual sequence of paralysis from dentition and intestinal irritation, and the further fact that there is no appreciable difference between the intra and extra-uterine deformity. Besides, other forms of paralysis are known to occur before birth, rendering the fact of intra-uterine paralysis indisputable."

The deformity of club-foot is caused simply by the continued action of muscular contraction on the bones of the foot—still soft and yielding—destroying their normal size and form, and consequently changing the form and the relation of parts in the entire foot. Whether the deformity occur before or after birth, there is always the same loss of muscular power—the same wasting of muscular tissue—the same contraction of the extensor muscles, with loss of irritability and power in the flexors. Dr. T. accounts for the difference in the contractile force of different muscles in the same paralyzed limb, by which the deformity of club-foot is evidently produced, by the relative position of the muscles—the extensors of the foot of the paralyzed limb as well as the extensors of the leg being kept constantly stretched to the very utmost, until their irritability and contractility are reduced beyond the effect of the primary paralysis. If, on the other hand, the muscles are allowed to relax, the corrugated condition of the contractile fibre is not destroyed but increased; consequently the muscle regains an amount of irritability and contractile power as much greater than the amount of the primary paralysis would imply, as the amount by which that of the extended muscles is diminished. Starting with the same degree of paralysis, it is seen how the varying results are brought about by accidental causes. Indeed, so far from the fact is it that paralysis causes certain muscles of themselves to contract (that form of paralysis preceding and causing these cases being meant, which is characterized by a simple stoppage of the usual nervous supply, but without irritation in the nerve centre), we shall find, as a matter of fact, that those paralyzed muscles are even less liable to shortening contraction than are healthy muscles.

To effect a cure in club-foot, it is evident that the shortened muscles must be elongated. This may be effected either by apparatus properly adapted to produce extension, or, when this is not possible, by tenotomy. Up to a certain point extension persistently applied will be effective in producing elongation of the contracted muscles. Elongation, however, is produced always by a reduction of the irritability of the muscle, and a diminution of its contractile power. The principal object gained by forcible enlongation of the shortened muscles, as in tenotomy, is liberation of the joint and possibility of motion. Tenotomy also should be considered like elongation by extension, as the very first step in treatment, and not as a last resort after all else has failed. We divide the tendon in order to liberate the joint, rendered inactive by the shortening of the muscles. If there is sufficient latent muscular power to be developed by this liberation, and by the exercise simply of locomotion, when possible, as it is in many cases of talipes, then tenotomy is proper. The operation is only a means to liberate the joint—the redevelopment which constitutes the process of recovery takes place subsequently. Whenever there is not sufficient muscular power remaining to effect the movement of the liberated joint, unless special means are adopted to promote the development of muscular power, the deformity will recur, no matter what had been the apparent benefit of the operation, to perform it, therefore, under such circumstances is unjustifiable. In the majority of cases after the liberation of joint movements, no recovery will take place without the employment of special means beyond the patient's own unaided efforts. Among the first of these in importance, according to Dr. T., is the application of as high a degree of artificial heat as can be borne; the application to be continued for months. This prepares the way for the special exercises by which alone a large proportion of the cases can be permanently benefited. These exercises must necessarily be as varied as the conditions of the cases are varied.

Accompanying Dr. T.'s paper are several drawings of apparatus found useful in various forms of club-foot and other forms of deformity resulting from paralysis.

The next paper is "The Census of New York, to be taken during the present year, considered in its Medical Relations." It is by Dr. F. B. HOUGH, superintendent of the census. It contains some good suggestions, which if faithfully and fully carried out will render the census about to be taken in our neighbouring city, particularly valuable in all its medical bearings.

The paper which follows is on "Phlegmonoid Erysipelas," by Dr. CHAS. C. F. GAY, of Buffalo. It appears that during the latter part of 1864 and the beginning of 1865, there occurred in the city of Buffalo, a number of cases of abscess—an unusual tendency to the formation of purulent deposits, and to the occurrence of cutaneous and cellulo-cutaneous forms of erysipelas, often the result of the slightest scratch or puncture. Dr. G., delineates the form of erysipelas denominated by him phlegmonoid, and which he believes pathologically considered to be as unlike the phlegmonous as the latter is unlike the cutaneous form of erysipelas, by the history of three cases treated by him. The peculiarity of phlegmonoid erysipelas is the formation of deep-seated abscesses with a general adynamic condition of the system. The general location of the abscess is upon the chest, though it has been met with, also, in the neighbourhood of the larynx, beneath the facia of the inferior serratus muscles, and beneath the gastrocnemius. The prominent causes of the disease are bad air, and food, and other bad sanitary and hygienic conditions. The chief remedies besides those adapted to support the strength and improve the nutrition of the patient, are anodynes, blisters, poultices, wet and dry cupping, and the knife. The latter is among the most important. It should be resorted to as early as possible, never waiting for the appearance of fluctuation. The use of iodine is strongly denounced by Dr. G.

We have next "Extracts from Letters received from Dr. HENRY S. WEST, Physician to the American Board for Foreign Missions." These extracts present a short sketch of the condition of medicine and surgery and of the medical and surgical professions at Sivas, Syria, with a short account of the principal prevailing diseases.

The following paper comprises "Observations on Cerebro-spinal Meningitis, or Spotted Fever, as it prevailed at Carbondale, Pa., in the Winter and Spring of 1863–64," by Dr. CHAS. BURR. Carbondale has always been noted for its exemptions from malarious and other epidemics. The spotted fever commenced in December, 1863, and soon spread over the whole place amid both rich and poor. The greater number of cases occurred in the following January: out of a population of 6,000, there were 400, chiefly children and young persons, destroyed. Though the disease lost its epidemic character towards the close of spring, yet sporadic cases of a milder character occurred throughout the year. It gave no indications of contagiousness.

The young, robust, and plethoric were the most liable to the disease. Of those attacked, a slight preponderance were males. When spotted fever occurred among a number of children and young persons, it often happened that *one*, *two*, or *more* only were attacked, while in other cases all the family would be taken down at the same time or very nearly so. The great majority of women who were attacked were mothers who had become worn out by want of sleep, care, anxiety, and grief consequent upon nursing children who had died of the disease. In some instances undue fatigue and exposure to cold appeared to act as exciting causes of the disease. The proportion of recoveries among mature adults was greater than among children and young persons.

The only remedy, says Dr. B., of which I can speak with confidence is free counter-irritation about the head, neck, and shoulders, and, if necessary, along the spine. In addition to this, Dr. B. keeps the bowels open, and uses such other remedies as the varying symptoms would seem to indicate, as opium to relieve pain, and tonics and stimulants to sustain the strength when this is failing.

The next is "On the Modus Operandi of Quinine," by Dr. H. N. EASTMAN, of Geneva Med. Coll., N. Y. Dr. Eastman's statement that he regards quinia as one of the chief of the antiphlogistics, if not the chief, will no doubt startle the majority of the profession, and yet, when all the facts connected with what are now ascertained, from careful clinical observations, to be correct therapeutical applications of the article, it will be found much nearer the truth than it would at first seem to be.

The ensuing article by Dr. ARMSBY, "On Ligature of the Subclavian Artery," will be found in the April number of this Journal for 1864.

The next paper presents "Suggestions relative to the Pathology of Pneumonia," by Dr. S. O. VANDERPOOL, of Albany. The suggestions thrown out by Dr. V. are, that pneumonia cannot result *alone* from exposure to cold, no matter how prolonged and intense, but that coexisting with such exposure there must be some morbid materials circulating in the blood which act upon the sentient fibres of nerves distributed to the air-cells of the lungs, partially paralyze them, and thus permit a change of temperature, or any irritant cause to produce the phenomena of inflammation and its sequences. Further, that in pneumonia two entirely distinct phases of disease are presented. In the first, lasting from four to seven days, the system is struggling to eliminate the poisoned material, during which period the symptoms are very acute and the arterial reaction violent. At the close of this stage there is a decided abatement in all the constitutional symptoms, and an exudation into the air-cells—hepatization. From this period commences the lung disease proper. Whatever of subsequent constitutional symptoms ensue, result from efforts to relieve the solidified air-vesicles of their foreign material.

This view of Dr. V. in respect to the pathology of pneumonia is no doubt true in respect to a limited number of cases, but we hardly think it can be shown to be a true theory of the disease in all cases.

The tolerably elaborate paper which follows, presenting a series of "Facts in Relation to Placenta Prævia, with a Review of the various Opinions respecting its Anatomy, Physiology, Pathology and Treatment," by Dr. ISAAC E. TAYLOR, Prof. of Obstet., Diseases of Women and Children in the Bellevue Hospital, etc. etc., must be carefully studied in extenso, in order to understand the value and true bearing of the following propositions, which Dr. T. believes to be proved by the facts adduced by him.

"1. The perfect integrity of the cervix uteri during utero-gestation, in its whole length; neither developing from above downwards, or from below upwards, but modified by physiological softening to prepare it for the office of expansion at the time of labour, and not before, for the exit of the child.

"2 The *placenta prævia* centralis is over the os uteri internum, and not in the cervix uteri at all, before labour commences, as is believed and depicted.

"3. The limit of spontaneous detachment of the lower polar circle—the boundary line of Dr. Barnes—is not the zone of safe attachment after separation of the placenta.

"4. The cause of arrest of the flooding in general is the limit of the expansion of the os uteri *internum* to the extent of 12 or 14 inches in circumference, and 3½ to 4 in diameter, and 3 in length.

"5. The boundary line thus reached by nature is only safe so far as separation occurs by the contractions of the uterus.

"6. The hemorrhage comes from the uterus as seen, and not from the placenta.

"7. The flooding is diastolic, not systolic.

"8. The method of separation of the placenta by the uterine contractions is from the centre, and not from the margin.

"9. The plan of Dr. Simpson is preferable in cases of extreme exhaustion to version, until nature can be restored in some degree to justify its performance.

"10. External version should be adopted first, in transverse presentations of the shoulder, neck, or face, before rupturing the membranes; if not successful, then internal and external version together; then, if the other methods fail, true version, but not rapidly.

"11. The former and usual plans are confirmed in their value by these investigations, such as tamponing, rupturing the membranes, and giving ergot."

The paper of Dr. T. is illustrated by eight well-executed lithographs.

In the next article attention is called, by Dr. WM. MANLIUS SMITH, to the excellent remedial properties possessed by certain *non-officinal compounds of iodine*. They are, 1st, the iodide of cinchonium. It appears to combine the resolvent properties of iodine with the tonic properties of cinchona. Hence suggesting itself as a remedy in strumous and tuberculous diseases. It is more easily kept unimpaired in activity, less disagreeable to the taste, and consequently adapted to all cases where iodine without iron is indicated. It is preferable to iodide of potassium, inasmuch as it rather increases than diminishes the digestive power of the stomach, and its use may be long continued without painful results. It can be given in doses of one, two or more grains.

A second preparation is the iodide of cadmium. The advantage it has over other preparations of iodine for external use, besides its want of colour, is its slightly irritating properties when applied to the unbroken skin. Dissolved in glycerine—60 grs. to one ounce of the latter—it is a very valuable local application in cases of bronchocele. It is to be applied twice a day, and a cloth wet with it kept on the swelling all night, and if convenient all day also. At the same time there is to be given internally, in most cases, three or four times a day, a pill composed of 1½ gr. of iodide of cinchonia and $\frac{1}{30}$ gr. of strychnia. Dr. S. remarks that all cases of bronchocele thus treated have rapidly improved, and when the use of the above remedies has been persevered in sufficiently long, the swelling has totally disappeared; in some cases in about one month, in others, however, only after three or four.

A very valuable paper on vaccination, and on the possibility of communicating syphilis and other diseases through the vaccine virus, is presented by Dr. CYRUS RAMSAY, Registrar of Records and Statistics of the City of New York. The writer has brought together, from a variety of reliable sources, a series of statistics and conclusions collected amid ample fields for observation, illustrative of the prophylactic powers of vaccination, the extent and duration of the protection afforded by it, and with proper care its freedom from any power of impairing the health of the system or of imparting to those upon whom it is performed any other disease than vaccinia—which of itself is incapable of causing any amount of suffering, and certainly no injury temporary or permanent in the case of the tenderest infant. The paper should be carefully studied by every physician.

The paper which follows is on "Smallpox in New York, with some Statistics and Remarks on Vaccination." It is the report of the Committee on Public Health of the New York Legislature, submitted Feb. 10, 1865, by Dr. W. H. Richardson, of Westport, N. Y. This is also a valuable document, and fully bears out the favourable verdict borne in favour of vaccination, by the medical profession in all countries as affording a certain protection against smallpox, when carefully performed with good and efficient matter, the certainty that complete prophylaxis has been imparted by it being tested in every case by a subsequent repetition of the operation.

Eleven cases are next presented by H. S. Downs, of New York, in illustration of the "mutual antidotal powers of opium and belladonna."

The following paper is on "The New Mode of Remedial Inhalation," being an abstract of a communication from Dr. L. Elsberg, of New York. The new mode of inhalation referred to consists in the adaptation of remedial agents for inhalation into the fauces, nares, larynx, and bronchi by *nebulization*. The nebulization of a fluid consists in dividing, by an appropriate apparatus, each drop into such innumerable fine particles that, forming a nebula or spray suspended in or mixed with the air, it may be freely inhaled. Those who feel inclined to test the therapeutic value of inhalation in the manner here proposed, will find, in the present abstract from Dr. E., a description of the best apparatus for nebulizing fluids, the proper mode for conducting their inhalation, and the nature and condition of the diseases in which inhalation of nebulized fluids is indicated.

The well-drawn up report of Dr. Sylvester D. Willard, "On the Condition of the Insane Poor in the County Poor-houses of the State of New York," reveals to us a state of things, the existence of which, in our ignorance, we could not have supposed possible at the present day among any civilized people. The miserable condition of the insane poor in the county almshouses of the State of New York calls loudly upon the legislature of that State to apply a prompt and efficient remedy to the abuses which exist; abuses, which, if they be allowed to continue, must necessarily cast a stigma upon the fair fame of our sister State.

The next paper is a report of the remarks of Dr. H. D. Noyes, on the optical principles of the ophthalmoscope and its use in diagnosticating diseases of the eye, introductory to the exhibition of several varieties of the instrument, and the explanation of their respective peculiarities. The great practical advantage of the ophthalmoscope is unquestionably accuracy of diagnosis in affections of the eye, and consequently more certain prognosis and more judicious treatment. If the disease be incurable, the fact is rendered patent, and a useless, perhaps exhaustive treatment avoided. If curable, the fact is promptly discovered, relieving the patient's mind of doubt and anxiety. Mistakes in diagnosis are avoided; such as referring impairment of vision to a congested or inflamed condition of the retina or choroid, when by the aid of the ophthalmoscope the true cause is found to consist in a condition of the eye which is to be overcome only by the assistance of proper optical glasses. Many cases of asthenopia, we are thus enabled immediately and permanently to relieve, that would not be so without the light afforded by the use of the instrument. These are some of the advantages gained by the employment of the ophthalmoscope—the furnishing us with positive facts in place of loose inferences—objective phenomena instead of subjective statements.

We have next the history of a very interesting "Case of Epithelial Cancer of the Left Cheek and adjacent Portion of the Lips," occurring in a female fifty-four years of age, in which by a removal of the entire substance of the cheek, and successful closure of the opening thus made by a plastic operation, an entire cure was effected with comparatively little deformity. The case is reported by

Dr. J. C. HUTCHINSON, Professor of Surgery in the Long Island College Infirmary. Its history is illustrated by well-executed lithographs, and accompanied with notes by Dr. J. C. Goodridge, Jr.

The ensuing paper "On Diploteratology," is a very learned, interesting, and instructive essay on *compound* human monsters. It is intended to comprise the history, literature, classification, description, and embryology, of double and triple formations, including the so-called parasitic monsters, fœtus in fœtu, and supernumerary formation of parts or organs in man. Its author is Dr. G. J. FISHER. The monograph will also present a brief history of the science, a chronological list of its bibliography; a synopsis of the principal classifications that have been adopted by various writers; the distinctive characters diagnostic of the several forms of compound monsters, with illustrative cases, the embryology of duplex formations, the relation of the subject to obstetrics and medical jurisprudence, with a general summary of the principles and laws deduced from the study of the subject in all its relations. When completed, if the entire plan be carried out by Dr. Fisher as laid down by him in the introductory chapter, the work will be a valuable addition to our medical libraries, replete with interest and solid instruction to every practising physician. The portion before us comprises only the history and bibliography of the science. Under the latter head a list of upwards of two hundred and thirty different works on the subject of monstrosity, issued from the middle of the sixteenth century to the present time, are given, interspersed with short bibliographical comments; besides numerous references to articles on the subject contained in the serial publications of some of the principal scientific societies of Europe.

The most curious part of the paper before us is the section on the fabulous period in the history of monstrosity extending to the eighteenth century. Casting our eyes over the plates by which this section is illustrated, we are struck with the strangeness and absurdity of the monstrosities pictured by writers of the olden time, and yet. it is rendered more than probable, by a careful study of them in the light of modern science, that they will be found, however absurd and fabulous in their distorted representation, to have been actually described and pictured from positive, though misapprehended facts related by ignorant and credulous persons.

The remainder of the papers in the the present volume of the *Transactions*, is an account of the revival and reorganization of the Cayuga County Medical Society, notice of the early physicians of Chautauque County, report of delegates to the New Jersey State Medical Society, and notices of deceased members of the New York State Medical Society, etc.

The volume closes with an abstract of the proceedings of the fifty-eighth annual session, list of delegates, of members, etc. etc.

2. The printed *Transactions of the twentieth annual meeting of the Ohio State Medical Society*, held June, 1865, commence with the journal of proceedings, after which follows a report "On Diseases of the Eye," by Dr. A. METZ, of Massillon. Though it contains no original observations, nor anything especially new in relation to the affections or the visual organs, the report of Dr. Metz is both interesting and instructive. It comprises a short notice of Donder's work on "Anomalies of Refraction and Accommodation," especially in reference to *hypermetropia and astigmatism*—faults of the refractive powers of the eye of somewhat frequent occurrence—and to *myopia*, with the proper treatment, hygienic and surgical, which is demanded in cases of these visual defects, especially the professions or occupations and physical habits to be avoided by those labouring under them; and the nature and power of the glasses to be worn by different patients according to the character and extent of their defect of vision respectively. Some remarks are likewise given in respect to the proper treatment of *granular conjunctivitis*. Under this head we are pleased to see the following point urged as one worthy to be kept in view during the daily practice of the physician.

"Perhaps the only real advantage we can claim for the present day, in the treatment of granular conjunctivitis, is the somewhat general recognition of the fact that we must rely more on the absorption of the granulations than on their destruction by caustics, and that we must always aim to preserve, if possible, the integrity of the conjunctiva."

The report closes with a short notice of the simulation of *amaurosis* by malingering soldiers, with the means for detecting the fraud.

"Some Observations on Blood Diseases." By Dr. E. B. Stevens, of Cincinnati. The subject of this paper is a most important one. We are rapidly drifting back in our doctrine of disease to the humoral pathology. Always all diseases, but especially idiopathic fevers, are, by many physicians of the present day, attributed to some vice of the blood, either to a destruction of its normal crasis, or to the introduction into it of some foreign poisonous matter. We fear, however, that the views in relation to this subject entertained by our contemporaries are but vague without the support of any series of well-established facts based upon close and cautious observations. There is much good sense exhibited in the remarks of Dr. Stevens, and he has certainly enumerated more than one unquestionable fact in relation to the subject of "blood diseases." His discussion of the subject is, however, too general and indefinite, with too little reference to known facts or pathological investigations, to lead to any safe practical conclusions.

Three highly interesting cases of "inversion of the uterus" are related by Dr. R. L. Sweeny, of Marion, in which reposition was effected, in one of them after a lapse of two months from the occurrence of the accident. The history of these cases is an additional contribution to the already accumulated evidence in favour of reposition in chronic cases of inversion of the uterus, and for an abandonment in such cases of excision by the ligature, scalpel, or ecraseur.

"Report on Puerperal Convulsions." By Dr. W. C. Hall, of Fayetteville. Of this very excellent report we can only afford room for the general conclusions as drawn up by the author.

1 "The nature of puerperal convulsions is yet undecided. 2. The cause or causes are undetermined. 3. Uræmia as the only cause is not only doubted, but denied, if not disproved. 4. The dependence of the convulsion upon the retained urea in the blood, by some supposed to be converted into carbonate of ammonia, is at best but a hypothesis, the truthfulness of which is strongly disproved by the experiments of Dr. W. A. Hammond, experiments precisely similar to the one performed by Frerichs upon which he reared his carbonate of ammonia theory. 5. Post-mortem revelations are unsatisfactory, and at best present but little that is positive in regard to the pathology of puerperal convulsions. 6. In reference to the treatment, the almost universal testimony is in favour of reasonable depletion, general and local. The use of chloroform and of opiates is strongly recommended and almost as strongly denounced. The speedy and prompt emptying of the uterus is the only part of the management of puerperal eclampsia, the propriety of which is universally agreed upon."

The report next in order is "On the Condition of the Insane Inmates of the Prison of Jefferson County." It depicts the deplorable want of humanity in the treatment of the helpless creatures immured in filthy, badly ventilated, and unfurnished cells, without a ready supply of water for allaying thirst and the preservation of personal cleanliness; destitute of a sufficiency of clothing to cover their nakedness, with a free commingling of the two sexes. The picture of this Ohio Insane Asylum reminds us of some of the reports of Howard as to the condition of similar institutions in Europe during the last century.

The remainder of the volume comprises a list of "surgeons of the Ohio regiments who died in the service of the United States, and obituary notices of deceased members of the State Medical Society." D. F. C.

ART. XXI.—*Reports of American Hospitals for the Insane:—*

1. *Of the Maine Hospital, for the fiscal year* 1864–65.
2. *Of the Vermont Asylum, for the fiscal year* 1864–65.
3. *Of the Worcester (Mass.) Hospital, for the fiscal year* 1864–65.
4. *Of the Taunton (Mass.) Hospital, for the fiscal year* 1864–65.
5. *Of the Northampton (Mass.) Hospital, for the fiscal year* 1864–65.
6. *Of the State Hospital of Pennsylvania, for the year* 1865.
7. *Of the Dixmont (Western Pennsylvania) Hospital, for the year* 1865.
8. *Of the U. S. Government Hospital, for the fiscal year* 1864–65.

BEFORE we enter more directly upon the examination of the pamphlets gathered from various quarters, and now lying together upon our table, we have a word to say to our friends, the Superintendents, with whom, for many a year gone by, we have "held sweet converse" through the medium of their annual reports.

When hospitals were but few, and there was no press of other matter for the pages of the *Journal*, we could give to the authors of these yearly missives a protracted hearing. But circumstances have changed, and we are now "cabined, cribbed, confined." While, on the one hand, the number of institutions for the insane has been largely increased, the progress of science, the greater number of medical writers, and the stupendous military and naval conflict through which the nation has recently passed, have combined in bringing so great a *stress* of material to each quarterly issue, that in the compilation of these notices much must be rejected which would otherwise find admission. In the course of the last few years no inconsiderable quantity of matter, in this series of articles, has been not only selected but put in type, and afterward "struck out," by the editor, solely for the want of room.

1. Applications for admission to the *Maine Insane Hospital* had become so numerous that an additional wing for the women's department was erected in the course of the fiscal year 1864–65.

	Men.	Women.	Total.
Patients in hospital, Dec. 1st, 1864	128	126	254
Admitted in course of the year	87	55	142
Whole number	215	181	396
Discharged, including deaths	73	46	119
Remaining Dec. 1, 1865	142[1]	135[1]	277
Of the discharged there were cured	31	16	47
Died	11	13	24

Died with consumption, 10; diarrhœa, 3; epilepsy, 2; congestion of the brain, 2; apoplexy, general paralysis, exhaustion, mania, pneumonia, gastritis, dysentery, and accidental drowning, 1 each.

"Among the assigned causes of insanity in those admitted since our last report," says Dr. Harlow, "was 'excessive use of tobacco.' Not only did the disease seem traceable directly to this as the prominent and exciting cause in these (two) cases, but we see daily the ill effects of the pernicious habit of smoking and chewing this noxious weed upon those who come to us for treatment. It seems to aggravate the disease in all cases, and cannot be too strenuously proscribed in the treatment of insanity, especially in cases of an acute form.

"Said one of the young men, during convalescence, whose insanity seemed to be the plain result of the excessive use of this deleterious production, 'I contracted the habit of using tobacco in the army, and during some of the long, tedious marches in which I was engaged, it was my main support, especially when short of provisions. I could march sixteen hours a day, with little or nothing to eat, only give me plenty of tobacco.' Just before his insanity assumed its most aggravated form, which was mental exaltation accompanied with brilliant delusions, he smoked between twenty and thirty cigars during an evening. This, he confessed, after recovery, was the cause of his malady.

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[1] The report says "one hundred and forty-three males, and one hundred and thirty-four males," but such is not the correct deduction from the preceding sums.

"The use of tobacco by persons in whom it has not become a second nature, tends to insomnolence, which, if long continued, produces mental disturbance and sometimes insanity."

2. In the report for the official year 1864–65, of the *Vermont Asylum for Insane*, Dr. Rockwell is, as is his wont, laconic in detail and brief in general.

	Men.	Women.	Total.
Patients in hospital, August 1, 1864	218	240	458
Admitted in course of the year	82	62	144
Whole number	300	302	602
Discharged, including deaths	59	63	122
Remaining, August 1, 1865	241	239	480
Of the discharged, there were cured			55
Died			42

"A good number have been restored to reason and those enjoyments which reason alone confers. The recovery of the curable is not the only benefit derived from institutions of this kind. To improve the condition of the incurable, so as to make them comfortable and happy, frequently requires more skill and perseverance than the restoration of the curable.

"Uncontrolled desires and unrestrained indulgence of temper will often prepare the young for that disordered state of the brain which strongly predisposes to insanity.

"One great preventive of insanity is the forming of correct habits. A person of peevish, fretful habit, and inclined to look on the dark side of things, is far more liable to become insane than one of a cheerful, hopeful disposition, who makes the best of every condition of life.

"Persons predisposed to insanity should avoid everything that has a tendency to impair the general health, such as want of physical exercise in the open air, passing too much time in warm rooms, sleeping on feathers, engaging in employments that will not allow sufficient sleep at proper hours, and allowing themselves to be too much disturbed by the unpleasant trials of life."

3. The general statistics of the *Worcester* (Mass.) *Lunatic Hospital*, for the year ending with the 30th of September, 1865, are as follows:—

	Men.	Women.	Total.
Patients in hospital Oct. 1, 1865	167	177	344
Admitted in course of the year	117	104	221
Whole number	284	281	565
Discharged, including deaths	115	109	224
Remaining, Sept. 30, 1866	169	172	341
Of the discharged there were cured	51	54	105
Died	12	21	33

Deaths from phthisis pulmonalis, 13; paralysis, 6; epilepsy, 4; inanition, 4; exhaustive mania, 2; marasmus, 2; and old age, 2.

"The death of those who die in the hospital is rarely attended with any apparent suffering or distress, and still more rarely is there any return of reason, bringing with it aspirations after a new mode of living, nor is there any appearance of agony or anxiety.

"The delusions of life often extend to its termination. Two of those who died during the year could not believe they were born to die. Death to them was not a reality. The belief in the immortality of their bodies was to them the only reality. In one the dread of death was more terrible than death itself, and having lived for years in the torment of insane fear, died at last in perfect quiet, unaffected and unappalled. Two died so suddenly that pain could hardly have been experienced, or the nature of the change appreciated. Four sank in the coma which succeeds epilepsy. In one, a morose and repulsive disposition was softened at the approach of death, and in another habitual acrimony and discontent were aggravated. One who had for weeks resisted every attempt at alleviation, was at last most distressingly eager for medical aid. One quite accurately foretold his death when its approach was not apparent. * * *

"The number of deaths in the hospital is pretty nearly determined by the number of epileptic, paralytic, and consumptive patients admitted."

One of the principal topics of Dr. Bemis's report is a proposition for the modification of the hospital, so that the accommodations and the privileges allowed the patients, as well as the restraints imposed upon them, shall be less uniform, and more in accordance with their diversified conditions. The doctor would effect this object by the construction of two classes of cottages, in the vicinage of the principal edifice, to be occupied by all to whom a larger liberty and a greater extent of privilege can be given, than to those who are turbulent, violent, or otherwise proper to be subjected to a closer confinement.

"In the carrying out of this or any similar plan," says Dr. B., "a departure would of course be made from the general style and character of hospital buildings. There would be the central edifice; the hospital proper, in which would be placed all the cases of acute mania, the violent and dangerous, the suicidal and troublesome; having every arrangement for classification, and every convenience for the treatment of insanity; with large and airy sleeping rooms, and day rooms, and with improved facilities for bathing, and a more reasonable arrangement for water-closets.

"There would be, on one hand, a few cottages, plain, neat, and convenient, for the quiet, harmless, and industrious of both sexes; with workshops where they could follow such industrial pursuits as could be made available, with the laundry and bakery for the whole.

"On the other hand, there would be the residences of others, who would devote their time to the cultivation of gardens, in music, reading and writing, walking and riding, and such other light occupations and amusements as they were accustomed to follow when in health.

"Then, there would be the chapel and lecture room, in which there would be at regular intervals, divine service and frequent lectures, sociables, and reading clubs.

"One great benefit to accrue from all this, is a near approach to the family system, and the kindly influences of home treatment. Could this system be adopted and carried into operation, the insane would have all the benefits they now have, with the added advantage of the family circle, to such as could be admitted to its privileges; homely surroundings, and the enjoyment of many of the social comforts which make life pleasant. They would have, also, the advantage of well-trained nurses and attendants, whose business for life it would be to care for and sympathize with them. They would enjoy a more free and generous style of amusement and exercise, and more frequently, and with less restraint, mingle in the society of friends and relatives—in a word, all the enjoyments of life would be multiplied, and all the social endearments, to a great extent, preserved, without diminishing in any degree the prospect of recovery, or increasing in any way the labours of the institution."

The plan here proposed is similar to that which, some years ago, was advocated by the late Dr. Galt, of the Williamsburg Hospital, Virginia, and by some European writers.

Another subject dwelt upon at some length in this report, is the devising of some means whereby "a full corps of reliable, well-educated, and thoroughly trained assistants" can be secured to the hospital. It appears to us very evident that this great desideratum can never be attained until the wages paid for such services are sufficiently large to operate as an inducement to make the employment a permanent business.

4. At the *Taunton* (Mass.) *Lunatic Hospital* the most important numerical results for the official year 1864–65, are as follows:—

	Men.	Women.	Total.
Patients in hospital, Sept. 30, 1864	164	199	363
Admitted in course of the year	97	100	197
Whole number	261	299	560
Discharged, including deaths	96	121	217
Remaining, Sept. 30, 1865	165	178	343
Of the discharged, there were cured	36	53	89
Died	20	12	32

Deaths from phthisis, 6; maniacal exhaustion, 5; general paralysis, 5; marasmus, 4; apoplexy, 3; paralysis, 2; fever, epilepsy, inanition, old age, suicide, erysipelas, and gastritis, 1 each.

The statistics of the hospital, from the time of its opening, show that the number of deaths from diseases necessarily springing from, or involving, organic lesion of the brain, is threefold greater among the men than among the women. This difference "may, perhaps, be accounted for by the fact that intemperance, licentiousness, and severe mental labour, are so much more frequent among the former."

"The fact," remarks Dr. Choate, "that the late civil war gave a decided check to the demands upon us, has continued during the past year. The number of admissions during the last four years has averaged twenty per cent. less than during the year immediately preceding the rebellion, and has been decidedly smaller than during any year since 1856."

"Seventy-two per cent. of all recoveries which have taken place in the past seven years, have been in cases which had been less than three months' duration before admission; ten per cent. in cases of between three and six months' duration; and seven per cent. in cases of between six and twelve months' duration; making an aggregate of ninety per cent. of all recoveries occurring in patients who had been less than one year insane before admission. Two and a half per cent. only had been insane more than three years.

"The circumstances of social position and pecuniary condition, of locality, of physical stamina, of cause, and of race, all materially affect the proportion of recoveries. As a general rule it may be stated, that among the poor a larger proportion are likely to recover, for the reason that they are of necessity earlier placed under hospital treatment, and we shall see that prompt and early attention is one of the most important aids to success in treatment; delay its most dangerous foe.

"In this important particular, the hospital is fortunate, as its patients are generally either from the poor or from a class in moderate circumstances. In the matter of cause, too, it is also fortunate. The physical causes largely predominate. In these there is the best field for medical treatment. Many of them, like intemperance, are removed by the mere fact of hospital restraint; others are capable of removal by judicious management. In the points of the locality from which the cases are received, of general physical health and constitution, and of peculiarities of race, we are less fortunate. About one-half of our admissions are from a large seaport city, and many of these from its worst classes. Evil habits, irregular living, hard labour, confined rooms, and a general disregard, often compulsory, of the laws of health, have impaired their physical systems so far that mortality among them becomes greater, and recovery necessarily less frequent. The large proportion which they bear to our whole number must increase our percentage of deaths, and influence unfavourably our percentage of recoveries. The large number of foreign lunatics received annually into this hospital, amounting to nearly half of the whole number of admissions, also affects unfavourably its curative results, as the records of lunatic hospitals show, beyond a doubt, that the ratio of recoveries among this class is smaller than among our native population."

From the remarks upon the predisposing causes of mental disorder, we take the subjoined extract:—

"The inquiry as to how hereditary tendency is formed, is the most important one in connection with the whole subject of insanity. That hereditary predisposition, like the large proportion of exciting causes, is originally within the control of the individual, and is produced by some violation of the laws of nature, seems in the highest degree probable. Indeed it is by no means unlikely, that the same causes, the same violations of nature, the same wrong way of life, not carried far enough in the first generation to excite disease, may in the second or third, or farther on, the same tastes and habits being transmitted, be finally sufficient by accumulation to produce it, or to produce in a whole family a condition of the constitution which will make them an easy prey to slight exciting causes of disease. And in this manner a man's sins and errors may most emphatically be said to be visited upon his children's children. Parents may unquestionably do much by a carefully considered plan of education, and by guarding their children closely from their own errors, towards warding off family diseases, and even towards breaking up hereditary tendencies. It is a most instructive fact, that in whatever direction we pursue our investigations into the cause of this direful disease, we must inevitably be brought to this same conclusion: the necessity of pursuing more closely the laws of nature; of obeying more strictly the dictates of a pure and enlightened morality."

5. It appears by the report of the *Northampton* (Mass.) *Lunatic Hospital*, that in the course of the official year terminating with the 30th of September, 1865, many improvements were made in the details of the internal construction of the building, rendering the operations of the hospital more easy, systematic, and orderly. A plan, simple and at the same time effective, for the distribution of supplies was introduced, and was working much to the satisfaction of both the executive officers and the trustees.

	Men.	Women.	Total.
Patients in hospital, Sept. 30, 1864	144	190	334
Admitted in course of the year	70	64	134
Whole number	214	254	468
Discharged, including deaths	56	60	116
Remaining Sept. 30, 1865	158	194	352
Of the discharged, there were cured	17	16	33
Died	17	24	41

Deaths from phthisis 14; marasmus 14; epilepsy 2; paralysis 2; injury 2; apoplexy 2; suicide 2; typhomania, dropsy, and intussusception, 1 each.

"Of the whole number of patients admitted in the year, the disease of only thirty-four was of less duration than one year. In all the rest it had passed into the chronic stage or form, the comparative incurability of which is now perhaps too generally known to require its re-assertion."

A very large proportion of the patients are incurables; no less than forty-four of that class having been transferred, in the course of the year, from the other State hospitals, and counted in the number of admissions.

"As insanity," says Dr. Earle, "may arise from a variety of causes, and be accompanied by a diversity of conditions of the body, either generally or of some one or more of its important vital organs, so the treatment in different cases varies. As in most other diseases, each case must be studied, and managed according to the conditions found.

"The great mass of medicine proper administered here, belongs, however, to a few classes of the materia medica. Tonics, stimulants, soporifics—with some alteratives and cathartics—such are the agents chiefly used.

"In the course of the past year, the hypodermic method of administering morphine has been used in several cases, with eminently beneficial effect. As that medicine, when thus administered, is not followed by the unpleasant consequences—sickness and headache—which so frequently succeed its hypnotic effects when given by the mouth; and as many patients needing it refuse to swallow *any* medicine, the hypodermic method becomes a resource of very great value in hospitals. 'Blessed,' as Sancho Panza said in reference to sleep, 'blessed be the man who first invented' it."

The report contains a pretty full exposition of the system of moral treatment, under the heads of Labour, Religious Worship, Lectures, Reading, Recreation and Amusement, and Dancing.

"Of all the means of amusement, no one during the past year has more constantly been in use than the billiard table. Several of the patients were good players before admission, and a considerable number have learned the game while here. It is an almost invaluable acquisition to the hospital. The game is peculiarly attractive, and hence patients who are indisposed to exercise sufficiently, or whose minds are so concentrated upon themselves that it is next to impossible to induce them to turn their attention to anything external, are more likely to become interested in it than in other games, or in manual employment."

"In this amusement (dancing), as in everything throughout the daily routine or the special exercises of a hospital, the great object—and the great triumph, if that object be attained—is, an approach as nearly as possible to the proprieties of the occasion, as exhibited in good society among the people at large. No fantastic dresses are permitted; no intentional exhibition of diseased vagaries of action allowed. Enjoyment for the multitude must not be sought by an exposure of the misfortunes of the individual. In short, it is intended that it shall be a rational amusement, pursued in a rational way."

6. The medical history of the *State Lunatic Hospital of Pennsylvania*, for the year 1865, furnishes the following numerical results:—

	Men.	Women.	Total.
Patients in hospital, Dec. 31, 1864	151	130	281
Admitted in course of the year	67	86	153
Whole number	218	216	434
Discharged, including deaths	61	67	128
Remaining, Dec. 31, 1865	157	149	306
Of the discharged, there were cured	17	23	40
Died	15	20	35

Causes of death.—Variola 5; exhaustion of chronic insanity 17; exhaustion of acute mania 4; phthisis pulmonalis 2; epilepsy 2; hydrothorax, dysentery, acute tonsillitis, paralysis, and apoplexy, 1 each.

Dr. Curwen gives an account of an epidemic of variola which prevailed in the hospital in the winter of 1864–5. We quote the most important passages.

"Introduced through some of those employed in the domestic arrangements of the hospital, the disease had infected a number of persons in different parts of the house, and had sickened them so as to confine them to their beds, before its true character was discovered. The number of male attendants, which was one-third less than usual, was rendered smaller by several leaving on account of the epidemic; and as it prevailed more extensively among the men, the duties of those who remained were much increased, and it became impossible to separate the sick entirely from the well, even if a room could have been had for the purpose. The only resource was in the ample use of disinfectants, and as free ventilation as the severely cold weather would permit. Vaccination was resorted to in a large number, and while it may have been of service in warding off an attack from some, it did not benefit others, whose systems were doubtless strongly infected at the time of their vaccination."

"The cases of the disease occurring in those employed, and among the patients, have been kept separate, with a view of seeing what the rate of mortality may have been in the two classes comparatively, and also to ascertain, if possible, the influence the nervous disorder of the patients may have had on the course and termination of the disease.

"The nervous disorder had an unquestionable influence in producing a fatal result (irrespective of any special complications), by lowering the general constitutional power, and thus rendering the system less able to react, cast off the disease and establish a healthy action. This was also shown in the cases of those who recovered, in that they were slower in regaining their previous bodily condition.

"Of those attacked among the employed, there were sixteen men and eight women. Of these twenty—thirteen men and seven women—had the disease in the simple or mildest form: some so lightly as not to confine them for more than part of a day. Four—three males and one female—had the disease in a severely confluent form, and of these two died—one man and one woman. The man died on the fifteenth day, or the eleventh from the appearance of the eruption, and the woman on the twelfth, or the eighth day from the appearance of the eruption.

"Among the patients there were fifty-three cases—thirty-three men and twenty women. Of these thirty-six—twenty men and sixteen women—had the disease in a mild form; fourteen—males ten and females four—had the severe confluent form of the disease. The deaths were ten, five of which—males three and females two—were the direct result of the disease. In the other five cases, there were various complications.

"The deaths took place on the following days, dating from the first symptoms of sickness: One on the sixth day (the case complicated with rheumatism and erysipelas); two on the seventh day (one of dysentery); one on the ninth day (that with epilepsy); one on the tenth day; one on the twelfth day; two on the fourteenth day; one on the twenty-sixth day (the very worst case of confluent smallpox which occurred during the epidemic, and I hope never to see another so bad); and one on the thirty-eighth day (that from dropsy of the chest).

"It may be noticed as an interesting fact, that erysipelas of the face and scalp prevailed in the hospital at the same time, and of those who suffered from smallpox, one had erysipelas preceding, and three following the attack.

"In reference to the matter of pitting by the pustules, it may be noticed as a singular fact that where the patient broke open the pustules, either just before or about the period of maturation, scarce any mark was perceptible.

"In one person there was an undoubted second attack of the disease, as the marks of the previous attack were clearly to be seen, and the patient had a distinct recollection of having been sick with it."

A discussion of the condition and the necessities of the chronic insane of the State occupies several pages of the report. Better, more extensive, and more nearly adequate provision for them is demanded. But in what way shall this be effected?

"No fallacy is more fanciful than that the chronic insane can be made to support themselves, or to assist in providing for their own maintenance, and every scheme projected with that view, will only waste more money than it will save.

"It seems to be forgotten by those who advocate such theories, that the insane labour under a nervous disorder, incapacitating them from continued exertion; that the longer the insanity, the greater, as a general rule, that incapacity; that the derangement of mind prevents that degree of thought and attention, necessary properly to execute; that a constant, careful supervision is needed to secure proper results, and that those who exercise this supervision, cannot attend to other duties; and that one active, industrious man would readily himself do the work of at least three of those he has to watch, and do it better.

"Nor should any countenance be given to the plan sometimes proposed of an institution exclusively for the chronic insane.

"The reciprocal influence of the recent and chronic insane is mutually beneficial, and many a recent case has been aided towards restoration by the kind words and gentle deeds of one supposed to be incurable, and the interest thus manifested has added light to the mind, hope to the heart, and restoration from disorder to the bestower of such kindly influence."

Hence the writer of the report advocates an increase of the number of hospitals based upon the same general principles as those which are already in operation.

"These buildings should be neat, plain, free from all unnecessary architectural embellishments and arrangements, strongly and securely built on the most approved and carefully arranged plan, with special adaptation to the purposes of their construction, and throughout the whole course of their erection under the direct supervision of one familiar with all the requirements of the treatment of the insane."

7. The *Dixmont Hospital*, the well-known department for the insane of the *Western Pennsylvania Hospital*, not being yet completed, its number of patients has grown to an excess of its accommodations. "The wards," writes Dr. Reed,

"are intended to accommodate one hundred and thirty patients. *Two hundred and four* now occupy them."

	Men.	Women.	Total.
Patients in hospital, Jan. 1, 1865	85	73	158
Admitted in course of the year . . .	64	57	121
Whole number	149	130	279
Discharged, including deaths	38	37	75
Remaining, Dec. 31, 1865	111	93	204
Of the discharged, there were cured . . .			34
Died			10

"One died exhausted by epileptic convulsions, one of typhoid fever contracted before admission, two of epilepsy, one from the exhaustion of chronic mania, two of enteritis, one of chronic gastritis, and two of old age."

Only thirty-eight of the patients remaining in the hospital at the close of the year were considered curable.

"As in previous years, the patients have enjoyed all the advantages to be derived from out-door exercise and from various occupations and amusements in-door. On several occasions the attendants and patients of the convalescent female ward prepared and presented to the household a series of tableaux, which not only afforded a healthy diversion to those immediately engaged, but were the source of great pleasure to the spectators. The selection of the pieces, the taste displayed in the arrangement, and the manner in which they were rendered, entitled the parties to this public acknowledgment."

8. We take the subjoined statistics from the *U. S. Government Hospital for the Insane*, for the fiscal year ending with the 30th of June, 1865:—

	Men.	Women.	Total.
Patients at the beginning of the year . .	265	86	351
Admitted in course of the year . . .	479	36	515
Whole number	744	122	866
Discharged, including deaths	576	29	605
Remaining at the end of the year . . .	168	93	261
Of the discharged, there were cured . .	334	14	348
Died	139	8	147

Died with "chronic organic and functional degeneration of the brain, without complicative or supervenient disease before death, 49; chronic organic and functional degeneration of the brain, with epilepsy, 12; ditto, with apoplexy, 5; with *paralysie générale*, 2; with tumour of the brain, 1; with typhoid fever, 14; with dysentery, 7; with diarrhœa, 1; with phthisis, 7; with albuminuria, 1; with hepatitis, 1; with bilious fever, 1; with pneumonia, 1; with erysipelas, 1; with gangrene of lung, 1; of maniacal exhaustion, 7; inanition, 8; typhoid fever, 12; diarrhœa, 1; dysentery, 2; general paralysis (simple), 2; epilepsy, 4; pneumonia, 1; asphyxia, 1; abscess of liver, 1; malarial exhaustion, 1; moribund on admission, 3."

Patients from the army at the beginning of the year . .	191
" " " admitted in course of the year . .	426
" " " remaining at the end of the year . .	106
Patients from the navy at the beginning of the year . .	18
" " " admitted in course of the year . .	10
" " " remaining at the end of the year . .	14
Rebel prisoners admitted in course of the year	4

The relation held by this hospital towards the military and naval powers during the late civil war, will justify a liberal extract from Dr. Nichols's report.

"The admissions this year, five hundred and twelve altogether, exceeded those of the previous year by six. While the army and navy furnished nearly eighty-three per cent. of the whole admissions, the number of military patients received was twelve less, and the number of civil cases, including rebel prisoners, eighteen more than last year.

"Though the active operations of the war continued through most of the period embraced in this report, it will be seen that it exhibits the commencement of a return towards the old ratios which the military and civil cases bore to each other. The current year will doubtless exhibit a further movement in the same direction. * * *

"It is an equally extraordinary and significant fact that the number of civil cases received into the institution during the four years of the war has exceeded the admissions during an equal preceding period only ten per cent., notwithstanding an estimated increase of the permanent population of the District of one hundred per cent., and two enactments by Congress—one providing for the care in the national hospital, during the war, of all transient insane persons found in the District without the means of self-support, and the other making like provision for the same period for all cases of insanity occurring in any part of the republic among the civil employés of the quartermaster's and commissary's departments of the army.

"This evident diminution in the relative prevalence of insanity in the District accords with the history of the disease throughout the loyal States; and it is thought to show that the mind of the country was raised by the war to a healthier tension and more earnest devotion to healthier objects than was largely the case amid the apathies and self-indulgences of the long-continued peace and material prosperity that preceded the great struggle. Whether or not a kind of mental collapse will follow a return of peace, and be attended with an increase of mental disease, will depend upon circumstances which we cannot pretend to definitely foresee. If it unhappily should, the truth of this theory would be demonstrated beyond a question, and the old notions—doubtless true as observed at other times and under other systems of government—of the effects of violent national struggles upon the psychological condition of the peoples affected by them, entirely reversed as applied to the citizens of the North American republic. It is but a slight license to say that the nation laid down its life to save it; and that the national mind rapidly acquired a firmer strength and a higher tone amid the harrowing incidents of such a gigantic and all-pervading strife and sacrifice, must be accounted one of the most remarkable and interesting events in the mental history of our race! But, after all, the same natural law to which the nation appears to owe an increase of mental strength amid a sudden, vast, and unprecedented expenditure of it, underlies some of the most familiar observations in psychology. The popular idea that weak and indolent minds in civilized society enjoy comparative immunity from derangement, is an erroneous one. All weakness invites disease, while strength repels it; and activity is a condition of strength. There is more insanity among the hinds and drones of mankind than among the Newtons and Websters. The capacity and application of philosophers and statesmen are associated with a strength and tone of the brain and nervous system which not only repel disease, but afford the innervation necessary to the vigour of the bodily functions. There are fewer dyspeptics among scholars than among unlettered men. It is true that poets—a class of most intellectual men—and madmen are thought to be allied; and it may be so. The mental constitution that affects the poetic fervor is not always, perhaps not generally, what is called a well-balanced one. Besides, the frequent exercise of the imagination in the conception of poetic images is apt to develop into inordinate activity a power of the understanding, especially when it is originally in excess, that is most prone to confound the ideal with the real, and thus establish one of the forms of the incipiency of insanity.

"The whole number treated in 1864–65 was eight hundred and sixty-six, against seven hundred and eighty-seven in 1863–64. As the number of admissions was nearly the same in each of the two years, the excess of seventy-nine treated this year was mainly due to the greater number in the house at the beginning of this than at the beginning of the preceding year.

"The proportion of recoveries was somewhat less during the last two than it was in the first two years of the war. The high proportion of incurable cases among the soldiers who have formed so large a moiety of our population during the war, and the payment of bounties for recruits, began at the same time. The relation that those concurrent events bore to each other is obvious. The various bounties, particularly the large sums paid for recruits during the last year of the rebellion, stimulated the cupidity of recruit and substitute brokers to the exercise of an ingenuity and perseverance, and to achieve a success, in imposing upon the army senility and childhood for vigorous manhood, and imbecility for soundness of understanding, which. had they been displayed in the genuine service of their country, would have commanded the blessings of a heroic patriotism. It was found that recovered soldiers discharged from the hospital and service, and paid off, and left to journey to their homes by themselves, were so frequently the victims, while on their way, of the diabolical arts of 'drugging' and robbery, and then of literal sale as recruits or substitutes, that no such patients were permitted to leave the institution during the last six months of the war, except under the personal protection of friends or officials. The fact that nine natives of Canada were admitted to the hospital during the period under review, while only two were received during its previous history of nine years, affords ground for the suspicion that our political neighbour on the north parted with some of her dependent population at a handsome premium. We could write the current history of several of the large almshouses and municipal institutions for the insane from the declarations of patients received into the hospital during the past year.

"The percentage of mortality this year was large, but, however much we may regret it, it seemed inevitable under the circumstances. Over seventy-two per cent. of the deaths were in cases of chronic insanity, and in three-fifths of the remaining cases the fatal event was due to morbid condition existing at the time of admission. By *inanition*, as an assigned cause of death, is meant the non-assimilation of food in consequence of a peculiar exhaustion of the vital forces. In these cases the mental disorder was not of an active and exhaustive type, and no acute idiopathic disease could be detected. The only exception to our remarkable exemption from local disease consisted in the communication of typhoid fever, with which many soldiers were admitted in the fall and winter, to some of the chronic cases already in the house, who, from defective innervation, offered but little resistance either to the invasion or progress of an asthenic disease, and for a few weeks the fever prevailed considerably in several wards on the male side of the house.

"The population of the hospital at the close of the last government year was less than it had been at any other time for two years previous. This reduction was mainly effected by embracing the favourable opportunity which the return in June of so many of the different organizations of the army to their respective States afforded to send home, in the care of comrades or officers, all recovered men, and most others who had evidently not become insane in the line of duty, and would certainly be properly cared for either by their friends or the local authorities."

Much was done in the course of the year towards the completion of this national hospital. P. E.

Art. XXII.—*Guy's Hospital Reports.* Edited by Samuel Wilks, M. D. Third series, vol. xi. London: John Churchill & Sons, 1865. 8vo. pp. 466.

The present volume of this valuable publication contains twenty original communications, eight lithographic plates, and a number of wood-cuts. As has been for some time past our practice, we shall lay before our readers a full analysis of its contents:—

I. *On the Value of the Study of Morbid Anatomy.* By Samuel Wilks, M. D.

The object of this paper is to set forth some of the principal facts taught by the study of morbid Anatomy, and also what may be hoped from further investigations.

The difference between health and disease. says one of the most instructive of modern writers in our profession, consists in the deficiency, that is, the temporary or permanent subtraction, of substance or power, and not in its unwonted increase. Pathological phenomena, he says, are the deformed remains of the normal vitality. (*Lectures Chiefly Clinical*, p. 604.) The same writer elsewhere declares his belief that "in no way is both the science and the art of healing so likely to be improved, as by the association in its literature, and through that in the minds of its practitioners, of pathology with physiology rather than with morbid anatomy; that juster theoretical views are elicited by looking upon disease as part of the phenomena of life than as the producer of appearances after death; and that patients are more likely to be cured by one, however original observer or reader, who is considering even imperfectly the vital actions exhibited by them, than if he knew exactly what would be the consequences of the disease in the corpse." (*Digestion and its Derangements*, p. 3.)

We do not know whose patients fare the best, those of Dr. Chambers or those of the zealous and enthusiastic student of morbid anatomy whose paper is before us. At all events, so far as their therapeutical views are concerned, they are not in discord. Reasoning, the one from cause to effect, the other from the effect to the cause, they both have reached very similar conclusions. "The changes which are met with in the dead body," says Dr. Wilks, "as affecting the viscera or tissues, are of a degenerative kind, whether we make use of the naked eye or employ the microscope for their elucidation." He believes, moreover, that particular tissues can only undergo particular changes; for instance, that the sole organic change to which the lungs are liable, is the production of a single cell-growth, as in pneumonia, or to a vitiated cell-growth, as in tubercle. Other changes found in organs are due to the seeds of disease being brought there through the circulation. When, for example, an abscess is formed in the lung, it is always a secondary and never a primary process; the blood is diseased, and the source of contamination will be found elsewhere in the body. What are the morbid changes peculiar and essential to the different tissues of the body, and what are foreign to them, must be shown by further study.

It is extremely gratifying to find those theoretical views, which we believe to be the basis of correct medical practice, supported by the conclusions of so thorough a morbid anatomist as Dr. Wilks.

II. *Additional Cases of Supra-renal Disease, with Remarks.* By SAMUEL WILKS, M.D.

In the number of this journal for January, 1863, we gave a review of a paper by Dr. Wilks on the *Morbus Addisonii*, which was continued in volume VIII. of the *Reports*. The present paper contains the histories of eight additional cases of this disease. Dr. Wilks still asserts that the disease of the capsules in morbus Addisonii is uniform and peculiar; that none other than this has yet been found in connection with the symptoms which Addison described, and none other which has been satisfactorily proved to be the sole cause of death.

III. *Cases of Enlarged Spleen, with Remarks on the Operation for its Removal.* By SAMUEL WILKS, M.D.

Having found in certain cases, where death occurred from impoverishment of the blood, at *post-mortem* examination, no disease in the body, except that the spleen was hypertrophied, Dr. Wilks considers it very clear that death was induced by the state of the spleen. As this organ may be removed with impunity from the lower animals, and as the human subject is said to have survived its removal by accident, he believes that the surgeon is at times justified in extirpating the organ.

IV. *Report on Lardaceous Disease.* By SAMUEL WILKS, M.D.

The chemistry and pathology of lardaceous disease have had much attention bestowed upon them during the past few years. That it is amyloid degeneration, as is taught by Virchow, is completely disproved, in our opinion, by the researches of Dr. Parry noticed in the number of this journal for April of the past year (p. 459). Lardaceous deposit is certainly a nitrogenized material.

A paper by Dr. Wilks, published in the *Reports* for 1856, contains an account of thirty-six cases of the disease under consideration; he now offers a further list of sixty cases that have occurred at Guy's Hospital during the past nine years. The whole series, containing ninety-six examples, proves indisputably that the disease is one implying a long-standing and deep-seated cachexia, and which is seen in its most intense form after a protracted caries and necrosis of the bone, which has had its origin in tuberculosis or syphilis. If no affection of the osseous system be present, the lardaceous disease is associated with tubercle in other parts of the body.

V. *Cases of Enlargement of the Lymphatic Glands and Spleen (or, Hodgkin's Disease), with Remarks.* By SAMUEL WILKS, M. D.

The cases described in this paper have certain affinities with the lardaceous disease, but Dr. Wilks believes them "to possess sufficient peculiarity to warrant their standing alone." They are mainly characterized by an enormous enlargement of the lymphatic glands throughout the body, with a peculiar white deposit in the spleen; the liver may contain similar deposits, and of late these have been discovered in other viscera. The lymphatic glands are large, firm, and translucent; showing under the microscope an abundance of cells scarcely distinguishable from the normal secreting bodies, and with more or less fibre-tissue. In the liver the material is much tougher and fibre-nucleated; whilst in the spleen, lungs, and kidneys, it is composed mostly of cells resembling somewhat those of tubercle.

As regards its degree of malignancy, this disease appears to take a place between cancer and tubercle; the growth in the glands with implication of the bronchial tubes and pulmonary tissue, resembling the former, whilst the mode of deposit in the splenic corpuscles and along the minute vessels of the portal system of the liver resembles tubercle.

The cases here given are fifteen in number.

VI. *Clinical Report on Diseases of the Testicle.* By THOMAS BRYANT.

This paper is one of very considerable length, occupying nearly eighty pages. It treats not only of diseases of the gland itself, but also of some of the enveloping tunica vaginalis, and of the spermatic cord. Although a good paper, it contains little calling for special remark. It may be new to some to find an India-rubber bag recommended for exercising pressure on a swollen testicle, in place of strapping with adhesive strips. It is to be noticed also that in operating for the radical cure of hydrocele, Mr. Bryant prefers the practice of injecting a mixture of the compound tincture of iodine, with a like quantity of water, to the introduction of setons, which of late has been warmly praised. Influenced by what we had read of the advantages to be derived from the introduction of a seton of silver wire, we once tried it, but shall never be tempted to repeat it.

A table, calculated to prove useful, of the diagnostic symptoms of chronic tumours of the testis is appended to this paper.

VII. *The Stereoscope, and Stereoscopic Results.* By JOSEPH TOWNE. (Section vi.)

In this section, Mr. Towne enters into a careful analysis of the experiments upon which Professor Wheatstone supports his stereoscopic theory, and brings forward a series of additional experiments, that exhibits the result of the stereoscope, and have a direct bearing upon the physiology of binocular vision. His paper is illustrated by two lithographic plates.

VIII. *On Cystic or Hydatiniform Disease of the Chorion.* By J. BRAXTON HICKS, M. D.

An hydatid mole is formed by the dilatation into cysts of the small villi of the chorion. Upon this all anatomists are agreed. The origin of the smaller growths found hanging from the other cysts is still a matter of dispute. Dr. Hicks supports the opinion, which we believe to be the correct one, that these are not only cysts growing from parent cysts, but merely "continuation of the growth after the normal type at first." These are not formations, therefore, to be considered as examples of "proliferous cysts," where one cyst is developed as the progeny of another cyst. This paper is illustrated by two lithographic plates.

IX. *Several Cases of Abdominal Tumour.* By S. O. HABERSHON, M. D.

The cases related in this paper are as follows:—

CASE 1. *Disease of the appendex cæci; suppuration in the centre of the ilium and in the course of the psoas and iliacus muscles; opening below Poupart's ligament; extension to the diaphragm; acute empyema.*

CASE 2. *Cancerous disease of the colon and duodenum; ascites; jaundice.*

CASE 3. *Cancerous disease of the liver; enormous enlargement; scarcely any jaundice; simple chronic ulcer in the duodenum; infiltration of bronchial glands at the root of the lungs.*

CASE 4. *Extensive cancerous disease of the stomach and liver; no vomiting.*

CASE 5. *Abdominal tumour in the right loin; calculus in the kidney; chronic pyelitis for about fifty years; cancerous disease of the kidney; extension through the diaphragm; death from acute pleuro-pneumonia.*

These cases are all extremely interesting and instructive, on account of the obscurity of the diagnosis and of many important pathological facts in their histories.

X. *Clinical Remarks on Diseases of the Skin.* By S. O. HABERSHON, M. D.

This is a good practical paper, one eminently qualified to aid in the treatment of a class of cases that often cause great annoyance and much suffering.

All diseases of the skin are thus arranged by Dr. Habershon:—

"I. LOCAL DISEASES.
1. *Animal parasites*—
Scabies, from *Sarcoptes hominis.*
Prurigo, from pediculi, &c. &c.
Vegetable parasites—
Tinea favosa, from *Achorion Schönleinii.*
Tinea tonsurans, from *Trichophyton tonsurans.*
Herpes circinatus, " "
Tinea decalvans, from *Microsporon audouini.*
Sycosis, from *Microsporon mentagrophytes.*
Pityriasis versicolor, from *Microsporon furfur.*
2. *Changes of individual structures.*
Pigment in ephelis, lentigo, vitiligo, leucoderma.
Sebaceous glands, in acne, molluscum, comedo, strophulus albidus.
Sweat glands, in miliaria, sudamina, &c.
Papillæ, in warts.
Lymphatics, in Barbadoes leg, elephantiasis.
Fibro-cellular tissue, in keloid and scleroma.
3. *Local inflammation of the skin.*
Erythema, as intertrigo, erythema læve.
Dermatitis.

"II. CONSTITUTIONAL DISEASE of a Strumous kind?
1. *Eczematous,* lichen, eczema, impetigo, pityriasis, or papular, vesicular, pustular, and scaly forms of eczema.
2. *Leprous,* ordinary lepra and psoriasis.
3. *Strumous,* in erythematous and furunculoid forms, and lupus.

"III. EXANTHEMS—acute blood changes.
1. *Contagious,* variola, vaccinia, varicella, rubeola, scarlet fever, typhus and typhoid fevers, erysipelas.
2. *Non-contagious,* erythema, roseola, urticaria, herpes (?), pellagra, frambæsia (?).
3. *From poisons,* mineral, vegetable, and animal, the last comprising pyæmia, glanders, malignant pustule.

"IV. CACHECTIC RASHES:—
1. *Defective general nutrition,* rupia, ecthyma, pemphigus, furunculus, carbuncle, leprosy?
2. *Defective blood conditions,* purpura and scurvy.
3. *Defective nerve supply?* melasma, prurigo senilis, &c.

"V. SYPHILITIC ERUPTIONS:—
Congenital, erythematous, lichenous, warty, fibroid, rupial, ecthymatous, scaly, tubercular.

"VI. CANCEROUS ERUPTIONS:—
Epithelioma, cancroid, melanosis, scirrhus.

"VII. CONGENITAL DISEASE:—
Ichthyosis, moles, nævi."

The practical advantages of the natural arrangement of these diseases are evident. The artificial classification usually adopted, that by Willan and Bateman, is founded upon the elementary appearance presented by the skin during diseased action, and it is a great assistance in forming our diagnosis to remember these divisions. In treatment, however, one such as that just exposed is much to be preferred.

XI. *The Ventilation and Warming of the New Wards, Hunt's House, Guy's Hospital.* By JOHN CHARLES STEELE, M. D.

In the erection of this building several novel principles were introduced with a view to effect a better system of warming and of ventilation than is generally obtained in hospitals. To understand the peculiar arrangements which are said to answer admirably, it is necessary to have the aid of the illustrative drawings by which this paper is accompanied. Contrary to usage, the vitiated air is removed from the wards by a series of flues, situated within a short distance from the floor. These flues empty into a tower, in which a powerful draught is obtained by the waste heat and smoke from furnaces.

XII. *On Vesico- and Recto-Vaginal Fistulæ, and Ruptured Perineum, &c.* By THOMAS BRYANT.

In this paper Mr. Bryant sets forth the principal practical points to be observed for success in the operations in question, and illustrates them by the histories of a number of cases.

In operating for the relief of vesico-vaginal or recto-vaginal fistula, one of the great difficulties is in obtaining a clean and even raw surface, by an incision around the whole margin of the opening. Every one who has operated knows how exceedingly difficult it is to prevent irregularity and raggedness in this cut. To facilitate this step of the operation, Mr. Bryant advises the use of what he calls a *guide*, which is an instrument shaped somewhat like a fork, with one or more curved prongs, which hold firmly the tissues to be pared away. In the introduction of the sutures he lays particular stress upon the necessity of inserting them at a considerable distance, say half an inch or more from the margin of the wound, of not adapting them too tightly, and of removing them so soon as the wound is healed. After the operation he removes the urine by periodically introducing a catheter, in place of retaining an instrument in the bladder. Opium is given by suppositories, in place of administering it by the mouth.

The points to be attended to in operating for lacerated perineum are thus described:—

"The surgeon having carefully examined the parts, and determined the important question of how much of the lacerated perineum requires closure, should place his patient on her back in the lithotomy position, and map out the portion of the membrane which he intends to remove, with a sharp scalpel.

"He must remember, as a point of primary importance, that the surface of the wound should be *clean and regular*, for it is essential to secure primary union of the two surfaces; the new perineum also, to be of permanent service, must be *firm, strong, and thick;* for if otherwise, the success of the case will be but partial or of little permanence.

"To secure these two objects, a free and clean section of the lacerated perineum is absolutely essential; it cannot be made too smooth, nor can the surfaces to be placed in apposition for union be too broad posteriorly towards the rectum; at least an inch of raw surface is not too much, when it can be secured, the width of the bared surface diminishing slightly towards the anterior portion of the labia. The best plan to obtain these results is to perforate the parts towards the centre, and, as it were, slit them up with one sweep of a sharp scalpel; the right half of the perineum being first treated, and the left subsequently, the whole area having been mapped out previously by a bistoury.

"This *first* step of the operation having been performed, the second, which is of no less importance, remains to be carried out, and that is the bringing of the parts into apposition and keeping them there by sutures. Wire sutures are probably the best for these purposes, for if they do not cause less irritation than smooth silk, they are at any rate more manageable. Each one should be inserted at least half an inch, or, better still, an inch from the margin of the wound, and brought out at its posterior border close to the vaginal mucous membrane; it should be then reintroduced at a corresponding point on the opposite side, and brought out at a spot similarly situated to the one at which it was introduced. When the recto-vaginal septum or sphincter ani has been lacerated, the introduction of the posterior suture is of critical importance, for it is an essential element of success that this septum should be likewise included and drawn forwards to the raw surface of the perineum by the suture. To secure this end, the suture must be introduced, as already described, at a point situated on a horizontal line passing through this septum; the needle is to be dipped well into the thickness of the tissues, and instead of making its appearance at the posterior margin of the wound, close to the vaginal mucous membrane, is to be made to pass through the thickness of the recto-vaginal septum, and then out of the right buttock, at a point corresponding to the one at which it was inserted in the left side. When this is well done, the wire or silk is buried completely in the tissues, and on being tightened the whole parts are drawn together, as it were towards a centre, corresponding to the anterior portion of the anus and posterior of the perineum. The other anterior sutures may be applied as already directed.

"With respect to the necessity of dividing the sphincter ani in this operation, I will only add that I have not yet met with a case requiring such treatment."

Success in cases of this kind depends greatly upon what are termed small matters, and recovery can only be secured by giving them the care and attention bestowed upon matters of great importance. On this account the histories of sixty patients treated by Mr. Bryant, here recorded in detail, will be found most instructive.

This paper is illustrated by several wood-cuts.

XIII. *Cases and Observations in Medical Jurisprudence.* By ALFRED S. TAYLOR, M.D.

These cases are eight in number, and each of them is particularly interesting.

The first is a case of the poisoning of three children with arsenic in vermin powder. They presented the usual appearances met with in poisoning with arsenic; the vomited matter was mixed with blood, bile, and flakes of mucus, and it deposited a sediment in which there were particles of a white sediment which was proved to be arsenic. The children were not seen for twelve hours after the poison had been taken, and they all recovered under the treatment adopted, which Dr. Taylor declares the best, namely, frequent doses of castor oil, with milk and barley-water, to promote the vomiting and purging.

It is important to notice that though the arsenic was taken at the same time and under the same circumstances, the symptoms varied in the time of commencement, duration, and nature. In one child the symptoms commenced in two hours. These were, according to the parents, sickness and thirst, followed by vomiting; pain in the abdomen came on subsequently, but this symptom did not exist when the boy was first seen by the physician, Mr. Boxall. At this time—that is, twelve hours after taking the poison—there was no pain in the bowels even on pressure, and neither pain nor tenderness at the pit of the stomach. There was also an absence of purging. In the two other children no symptoms of poisoning appeared until after the lapse of five hours. This is an unusually long interval, as the average period, according to Dr. Taylor, before the occurrence of symptoms in cases of acute arsenical poisoning, is from half an hour to an hour. The first symptoms here were vomiting, with pain in the bowels; when Mr. Boxall saw them there was thirst, with nausea, but no vomiting or purging.

The second case is one of death from perforation of the jejunum as a result of disease; the death being apparently a result of violence. Here, but for a careful search made, the peritonitis of which the man died would have been referred to violence sustained during wrestling.

The third case (called *fourth* in the original paper) is one very similar in its details, and in the medico-legal inferences to which it leads. A healthy-looking young man was thrown in a drunken quarrel, and died in twenty-four hours, with abdominal symptoms. In the transverse colon was found a chronic ulcer, that had caused rupture of the intestine, and extravasation, followed by peritonitis and death.

The fourth case is one where a boy was accidentally strangled by his neck-tie, in some machinery. This case corroborates the general medico-legal opinion that complete occlusion of the trachea is attended with immediate insensibility, and that a person may recover in spite of the complete suspension of respiration for one minute.

The fifth case is that of a man who was run over by a light cart. The dresser at the hospital found three ribs fractured, for which a bandage was applied, and the man walked home. He died about 11 o'clock on the same evening. At the autopsy not the slightest bruise could be found externally to indicate which was the injured side. On opening the abdomen, a large quantity of blood was found, that proceeded from the right kidney, which was torn transversely completely in half.

The sixth is a case of poisoning by opium, and the seventh is one of poisoning by belladonna. They are of interest on account of the prevalent opinion as to the antagonistic effects of these substances.

The eighth case illustrates the effects of a large dose of the extract of datura stramonium, and Dr. Taylor takes the opportunity of contrasting the properties of daturia and atropia. Dr. Taylor concludes this instructive paper by some very important considerations upon strychnia both as a medicine and as a poison.

XIV. *Clinical Lectures delivered at Guy's Hospital during the Winter Session*, 1864–5. By. John Hilton. (Arranged for publication by George Eastes, from notes taken by himself and Henry Denne, Mr. Hilton's dressers.)

In his clinical lectures Mr. Hilton pursues the plan of taking up one case, and of entering fully into all the details of its symptoms and treatment, explaining thoroughly the why and wherefore of everything connected with it. This is far more beneficial to the student in our opinion than the plan usually adopted of bringing up a large number of different cases and then making upon each only a few leading remarks.

The cases upon which the present lectures are founded are: fracture of the clavicle; concussion of the brain with depression of bone; strangulated oblique inguinal hernia; irreducible inguinal omental hernia; compound separation of carpal epiphyses of both radii from the shafts of the bones, with tetanus; senile gangrene, and fracture of eleventh dorsal vertebra.

We will only say of these lectures that we have seldom read anything with so much pleasure and instruction.

XV. *Case of Ruptured Popliteal Artery.* By Alfred Poland.

This case is one where the popliteal artery was ruptured in a vertical direction, and to a very large extent, without any violence whatever or any other injury; the patient was walking at the time of its occurrence. The only explanation is that the artery was in an atheromatous condition, and thus rendered more easily lacerable. After the amputation of the limb, which was finally necessary in order to save life, the tissues were found in a state of fatty degeneration, and the bones very oily.

Three additional cases treated in the hospital are appended; although meagre in detail, they are interesting.

Mr. Poland's case is accompanied by a coloured lithographic plate, representing the lacerated bloodvessel.

XVI. *Poisoning with Fungi. Fatal Effects of the Amanita Citrina on a Woman and Child.* By ALFRED S. TAYLOR, M. D.

This paper contains the details of two cases of poisoning from eating mushrooms, with remarks upon the symptoms observed in similar cases, and the nature and properties of the poison existing in these noxious vegetables.

XVII. *Cases of Rheumatic Fever, treated for the most part by Mint Water; collected from the Clinical Books of Dr. Gull, with some Remarks on the Natural History of that Disease.* By HENRY G. SUTTON.

These cases are twenty-one in number. They are invested with considerable interest, from the fact that they were treated by such simple means, that they might almost be considered as unassisted by any remedy. It must not be forgotten, however, that rest in bed, a well-regulated diet, and good nursing, are powerful elements in the treatment of any acute disease.

These cases show among other things that the symptoms of rheumatic fever may, unaided by any treatment, entirely abate in five, six, seven, or eight days; that too much importance has been attributed to the use of medicines, and that the best treatment for rheumatic fever has still to be determined.

XVIII. *Four cases of Rheumatic Fever, treated with Mint-Water only.* With remarks by G. OWEN REES, M. D.

These cases, like those in the preceding paper, are reported by Dr. Sutton. Dr. Rees says that for his part, their results have firmly impressed him with the belief that the old plan of treatment consisting in the exhibition of calomel, opium, and antimony, and the free use of colchicum, did great harm, not only by retarding recovery, but by leaving the patient greatly debilitated.

A table is attached to this communication containing forty-one cases of rheumatic fever, containing all the important facts connected with them, in a form very readily to be consulted.

XIX. *Select Clinical Reports* (*Memoir IV.*) By G. H. BARLOW, M. D.

The subject treated in this paper is *cardial obstruction, the result of intrauterine disease.* In an appropriate case, whose history is given in minute detail, there was febrile disease of the mother before delivery; lividity of the child; subsequent dyspnœa; increase of symptoms about the age of puberty; engorgement of heart, lungs, and liver; dropsy; death from apnœa. At the autopsy, very old pericardial adhesion was found, which had proceeded as far as ossification.

Among some valuable observations upon the therapeutics of cardial affections we wish to call attention to the following, as we have reason to believe that digitalis is given too indiscriminately.

"I would here add, as the result of considerable experience in cardiac disease, that in cases of this class (disease of the mitral valve) where it might be said that the character of the pulse resembles that produced by digitalis, it may be employed with confidence, though always with caution; whereas, in those cases in which the obstruction or regurgitation was distal to the mitral valve, and of which I have adduced aorta disease as the typical instance, digitalis is of little service, and its use attended with much risk; ammonia and senega, with moderate stimulation, being the appropriate remedies."

XX. *A Description of the Appearances of the Human Eye in Health and Disease, as seen by the Ophthalmoscope.* (First Series.) By C. BADER.

This paper treats of the ophthalmoscopic examination necessary in order to determine the shape of the eyeball, or more correctly, the distance of the yellow spot to the point in the eye where the rays coming from an object cross each other; the curvature of the crystalline lens and cornea, and relation of the cornea as to distance from the lens, being supposed to be normal.

An accompanying plate with three figures shows the appearances in the emmetropic, the hypermetropic, and the myopic eye.

We cannot close this notice of another volume of Guy's Hospital Reports without remarking upon the great value of such publications, and expressing the wish that the medical men attached to similar institutions in this country would follow so good an example.

"Wherefore," says Jean Louis Petit in the preface to his treatise of the diseases of the bones, "it is necessary for such as have practised, and continue therein, not to be sparing of their knowledge; but that they either communicate it during their lives, or at least leave it to persons who may publish it after their decease. *Not to do so, is to commit a crime against humanity; it is violating the laws of society, and (to use that expression) dying insolvent.*" W. F. A.

ART. XXIII.—*On the Arrangement of the Muscular Fibres in the Ventricles of the Vertebrate Heart; with Physiological Remarks.* By JAMES BELL PETTIGREW, M. D., Edinburgh, Assistant in the Museum of the Royal College of Surgeons of England, etc. From the Philosophical Transactions, Part III., 1864. London. 4to. pp. 445 to 500.

On the Relation, Structure, and Function, of the Valves of the Vascular System in Vertebrata. By JAMES BELL PETTIGREW, M. D., Edinburgh, etc. Reprinted from the Transactions of the Royal Society of Edinburgh, Vol. XXIII., Part III. Edinburgh. 4to. pp. 761 to 805.

THE principal part of the first of these papers was presented to the Royal Society of London in November, 1859, and formed the subject of the Croonian Lecture for 1860. It consists of four parts or sections, the first of which treats of the anatomy of the ventricle of the fish; the second of the anatomy of the ventricle of the reptile; while the third and fourth divisions are devoted to the structure of the ventricles of the bird and mammal.

In the summer of 1858, Dr. Pettigrew made numerous dissections of the hearts of many species of fishes, reptiles, birds, and mammals, with the especial object of determining the precise arrangement of the muscular fibres, an arrangement, as he well observes, so unusual and perplexing that it has long been considered as forming a kind of Gordian knot in anatomy. Vesalius, Albinus, Haller, and De Blainville, after making various attempts to unravel this anatomical mystery, confessed their inability to do so. In 1669, Dr. Richard Lower announced, as the result of his investigations, that the external fibres of the ventricles of the mammals proceed in a spiral direction from left to right downwards; while the internal fibres run from left to right upwards. At the apex the fibres are continuous, and form an imperfect figure of 8. Gerdy adopted the opinion of Lower, adding that all the fibres of the heart form loops, the apices of which look towards the apex of the heart. More recently, however, Dr. Duncan, Jr., of Edinburgh, maintained that the ventricular fibres form twisted loops, which look towards both the apex and the base. Senac, in the last, and Dr. John Reid, in the present century, showed that the fibres of the external and internal surfaces of the ventricles are more vertical in direction than the deeper or more central fibres, the latter being more circular.

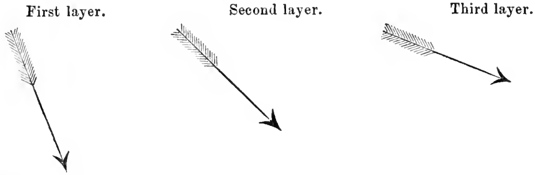
As the result of his own labours in this field of inquiry, our author presents us with the following summary of the facts which he considers that he has established:—

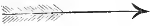
"I. By exercising due care, I have ascertained that the fibres constituting the ventricles are rolled upon each other in such a manner as readily admits of their being separated by dissection into layers or strata, the fibres of each layer being characterized by having a different direction.

"II. These layers owing to the difference in the direction of their fibres, are well marked, and according to my finding, are seven in number—viz., three external, a fourth or central, and three internal.

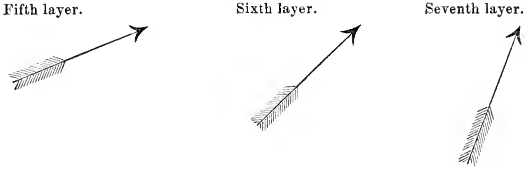
"III. There is a gradational sequence in the direction of the fibres constituting the layers, whereby they are made gradually to change their course from a nearly vertical direction to a horizontal or transverse one, and from the transverse direction, back again to a nearly vertical one. Thus, in dissecting the ventricles from without inwards, the fibres of the first layer, which run in a spiral direction from left to right downwards, are more vertical than those of the second layer, the second than those of the third, the third than those of the fourth—the fibres of the fourth layer having a transverse direction, and running at nearly right angles to those of the first layer. Passing the fourth layer, which occupies a central position in the ventricular walls and forms the boundary between the external and internal layers, the order of arrangement is reversed, and the fibres of the remaining layers, viz., five, six, and seven, gradually return in an opposite direction, and in an inverse order, to the same relation to the vertical as that maintained by the fibres of the first external layer. This remarkable change in the direction of the fibres constituting the several external and internal layers, which is observed to occur in all parts of the ventricular walls, whether they be viewed anteriorly, posteriorly, or septally, has in part been figured by Senac,[1] and imperfectly described by Reid,[2] but has not, so far as I am aware, been prominently brought forward by any one. A few arrows will illustrate the gradation in direction referred to.

External layers proceeding from left to right downwards of the spectators (posterior aspect).

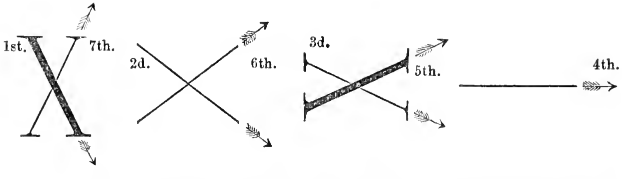

First layer. Second layer. Third layer.


Fourth or circular layer occupying a central position in the ventricular walls.

Internal layers proceeding from right to left upwards of the spectator (posterior aspect).


Fifth layer. Sixth layer. Seventh layer.

"IV. The fibres composing the external and the internal layers are found at different depths from the surface, and from the fact of their pursuing opposite courses cross each other—the fibres of the first external and last internal layers crossing with a slight deviation from the vertical, as in the letter X; the succeeding external and internal layers, until the fourth or central layer, which is transverse, is reached crossing at successively wider angles, as may be represented by an ⋈ placed horizontally:—



"V. The fibres composing corresponding external and internal layers, such as layers one and seven, two and six, &c., are continuous in the left ventricle at the left apex, and in the right ventricle in the track for the anterior coronary artery, the fibres of both ventricles being for the most part continuous likewise at the base.[1]

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[1] Traité de la Structure du Cœur, &c. Paris, 1849.
[2] Cycl. of Anat. and Phys., Article Heart. London, 1839.

"VI. From this distribution of the fibres, it follows that the first and seventh layers embrace in their convolutions those immediately beneath them, while these in turn embrace those next in succession, and so on until the central layer is reached—an arrangement which may in part explain, alike, the rolling movements and powerful action of the ventricles.

"VII. The fibres of the right and left ventricles anteriorly and septally are to a certain extent independent of each other; whereas posteriorly many of them are common to both ventricles; *i. e.*, the fibres pass from the one ventricle to the other—an arrangement which induced Winslow[2] to regard the heart as composed of two muscles enveloped in a third. It will be evident from this distribution of the fibres, that while the ventricles are for obvious reasons intimately united, they nevertheless admit of being readily separated.

"VIII. If the hinge-like mass of fibres (common fibres) which unite the right ventricle to the left posteriorly be cut through, and the right ventricle with its portion of the septum detached, the left ventricle will be found to be nearly as complete as it was before the separation took place, and to consist of four sets of conical spiral fibres—two external and two internal sets.

"On the other hand, the right ventricle, and its share of the septum, consists only of conical-shaped spiral fragments of fibres, or at most of flattened rings—a circumstance which, when taken in connection with others to be mentioned presently, has induced me to regard the left ventricle as the typical or complete one, the right ventricle being a mere segment or portion nipped off at some period or other from the left.

"IX. If the right ventricular walls be cut through immediately to the right of the track for the anterior and posterior coronary arteries, so as to detach the right ventricle without disturbing the septum, and the septum be regarded as forming part of the left ventricular wall, it will be found that the fibres from the right side of the septum, at no great depth from the surface, together with the external fibres from the left ventricular wall generally, enter the left apex in two sets; and if their course in the interior be traced, they are observed to issue from the left auriculo-ventricular opening, also in two sets; in other words, the left ventricle is bilateral. I would particularly direct the attention of investigators to this bilateral distribution of the fibres, as it has been hitherto overlooked, and furnishes the clue to the arrangement of the fibres of the left ventricle.

"X. The double entrance of the fibres at the left apex, and their exit in two portions from the auriculo-ventricular opening at the base, are regulated with almost mathematical precision; so that while the one set of fibres invariably enters the apex posteriorly, and issues from the auriculo-ventricular opening anteriorly, the other set as invariably enters the apex anteriorly, and escapes from the auriculo-ventricular opening posteriorly. But for this disposition of the fibres, the apex and the base would have been like the barrel of a pen cut slantingly or lopsided, instead of bilaterally symmetrical as they are.

"XI. The two sets of fibres which constitute the superficial or first external layer of the left ventricle, and which enter the left apex in two separate portions or bundles, are for the most part continuous in the interior with the musculi papillares, to the free ends of which the chordæ tendineæ are attached. These columns occupy different portions of the left ventricular cavity, and give a very good idea of the symmetry which prevails throughout the left ventricular walls.

"Lastly. The apex is opened into and enlarged, and the auriculo-ventricular orifice widened, by the removal of consecutive external and internal layers, from the fact of the left ventricular cavity tapering in two directions and forming a double cone."

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[1] The late Dr. Duncan, Jr., of Edinburgh, was aware of the fibres forming loops at the base, but seems to have had no knowledge of the continuity being occasioned by the union of the fibres of corresponding external and internal layers, or that these basal loops were prolongations of like loops formed by similar corresponding external and internal layers at the apex—a view which the author believes is here set forth for the first time.

[2] Mémoires de l'Académie Royale des Sciences, 1711, p. 197.

The subject discussed in the second of these memoirs is of as much importance in a medical as in an anatomical point of view. As the physician in distinguishing between the different organic diseases of the heart is mainly guided by the sounds and impulse, and as the latter phenomena are intimately associated with the action of the auriculo-ventricular and semilunar valves, it is evident that an accurate theory of the manner in which the opening and closure of these valves is affected is of the greatest importance. Unfortunately, however, physiologists are not agreed upon this point. By some it is maintained that during the ventricular systole the valves are floated up by the blood, which, acting upon them from beneath, presses their edges or free margins into close apposition, and causes the segments to occlude completely the auriculo-ventricular orifices. The musculi papillares and carneæ columnæ are supposed to play no part in these movements, while the chordæ tendineæ acting mechanically like so many stays, prevent eversion of the segments in the direction of the auricles. Sir C. Bell, Baumgarten, Hamernjk, and many others, have advocated this view. In the recent work of Dr. Austin Flint, Jr. (*The Physiology of Man*), we find it expressly stated that "the auriculo-ventricular valves are closed by the pressure of blood against them during the ventricular systole." This is, indeed, the generally received opinion. Mayo, Bouillaud, Reid, and others, contend that the closure of these valves is effected not by the blood, but by the musculi papillares, which, in contracting with the other fibres of the ventricles draw the lips or free margins of the segments closely together in the axis of the auriculo-ventricular openings, thus forming two impervious cones, the apices of which project downwards into the cavities of the ventricles. In this view the chordæ tendineæ, which are regarded as the proper tendons of the musculi papillares, are supposed to act as adjusters or adapters of the segments.

The views entertained by Dr. Pettigrew upon this interesting subject are so clearly enunciated in the monograph before us, and appear, withal, to constitute such a truthful exposition of the manner in which the mitral and tricuspid valves are closed, that we transfer to our pages, without hesitation, his own account of the action of these valves.

"In the valvular controversy, as in most others, a certain amount of truth is to be found on either side; and I have to express my conviction, that both theories (conflicting though they appear) are virtually correct as far as they go, but that neither the one nor the other is sufficient of itself to explain the gradual, and to a certain extent self-regulating process, by which the auriculo-ventricular valves are closed and kept closed. On the contrary, I believe that the closure is effected partly by *mechanical* and partly by *vital* means. In other words, that the blood towards the end of the diastole and the beginning of the systole forces the segments in an upward direction, and causes their margins and apices to be so accurately applied to each other as to prevent even the slightest regurgitation; whereas, during the systole, and towards the termination of that act, the valves are by the contraction of the musculi papillares, dragged down by the chordæ tendineæ into the ventricular cavities to form two dependent cones; this downward movement of the segments permitting the blood in the auricles to descend into the ventricles, so as to relieve the congestion of the former.

"Granting that the foregoing hypothesis is correct, there is yet another point *as to the manner of the closure*, to which I am particularly anxious to direct attention, as it is of primary importance, and appears to me, by some unaccountable means, to have hitherto escaped observation. I refer to the spiral form assumed by the blood in the ventricular cavities, which, as has been already partially explained, causes it, towards the end of the diastole and the beginning of the systole, to act in *spiral waves* mechanically on the segments, with the effect of *twisting and wedging them into each other in a spiral upward direction*. I allude, also, to the spiral course pursued by the musculi papillares; these structures, as the systole advances, contracting in such a manner as occasions the spiral descent of the segments into the ventricular cavities, to form *two spiral dependent cones*, the apices of which are directed towards the apices of the ventricles. As the decrease of the blood in the ventricles is followed, as has been stated, by a corresponding increase in the auricles; the blood in the latter assists in keeping the free margins and apices of the segments from being everted by the uniform pressure exercised on them by the blood in the former, during the systole. From this account of the closure of the auriculo-ventricular valves, it will be perceived that the valvular segments form two movable partitions or septa, which rise and fall during the action of the heart, in the same way that the diaphragm rises and falls during the respiratory efforts. The advantages arising from such an arrangement are very great. *When the ventricles are full of blood*, and the auricles empty, or comparatively so, the valvular septa are convex towards the base of the heart, and protrude into the auricular cavities. When, however, *the auricles are full of blood*, and the ventricles all but drained of it, the valvular septa descend so as to protrude in a downward or opposite direction. Certain portions, therefore, of the auriculo-ventricular cavities are common alike to the auricles and to the ventricles; and it is important to note this fact, as the valvular septa by their rising and falling, at one time increase the size of the ventricular cavities while they diminish the auricular ones, and *vice versa*. The principal object gained by the descent of the segments into the ventricles is the diminution of the ventricular cavities towards the base; the dependent cones formed by the valves fitting accurately into the conical-shaped interspaces situated between the slanting heads of the musculi papillares and the auriculo-ventricular tendinous rings. As the musculi papillares, on the contraction of the ventricles, mutually embrace and twine round each other, the obliteration of the ventricular cavities is by this arrangement rendered very complete. 'That the ventricles empty themselves during the systole, is rendered probable from analogy, for on watching the hearts of cold-blood animals, they are found towards the end of the contractile act to become quite pale, not, as Harvey supposed, from the blood being pressed out of the parietes, but from the blood in their cavities seen through their transparent sides being almost entirely expelled.' An important inference to be deduced from the spiral nature of the ventricular fibres and ventricular cavities and *the undoubted spiral action of the auriculo-ventricular valves* is the effect produced on the blood as it leaves the ventricles, that fluid being unquestionably projected by a wringing or twisting movement, which communicates to it *a gliding spiral motion*. This view is favoured by the spiral inclination of the sinuses of VALSALVA to each other, these structures gradually introducing the blood so projected into the vessels. How far the rotatory movement referred to extends into the arteries is difficult to determine; but when the smooth cylindrical nature of the vessels, and the great velocity and force with which the blood travels, is taken into account, there is every reason to suppose that the distance is considerable."

Dr. Pettigrew next advances weighty reasons to prove that neither the theory which attributes the closure of the auriculo-ventricular valves to the mechanical floating up of the segments from beneath by the blood forced by the auricles into the ventricles, distending equally in all directions—or that which ascribes it entirely to the contraction of the musculi papillares are either of them adequate to explain all the phenomena. He then states that "one complete closure of the mitral or bicuspid valve" may be briefly described as follows:—

"The segments are first floated gently and gradually upwards, by the uniform expansion of the blood forced into the left ventricle, during the diastole, by the contraction of the left auricle. *This is a purely mechanical act, and during its performance the valve, and chordæ tendineæ, are entirely passive.* When, however, the ventricle suddenly contracts, the margins of the valve, which were in apposition, although not in actual contact, are rapidly approximated (the left auriculo-ventricular opening being instantly closed[1]); and the two spiral columns of blood set suddenly in motion by the ventricular systole, *force the segments of the valve, in an upward spiral direction, rendering them more and more tense, until they reach the level of the ventricular orifice; at which point they are*

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[1] Regurgitation is prevented in the inverse of the rapidity with which the closure takes place.

twisted and wedged into each other; the chordæ tendineæ limiting the amount of upward motion, to prevent retroversion and regurgitation. As, however, the blood finds its way through the aorta, which it does the instant the segments of the valve are screwed home,[1] *the segments gradually but rapidly descend in an opposite direction to that by which they ascended, their descent being occasioned, regulated, and minutely graduated by the contraction of the musculi papillares, aided by the chordæ tendineæ and by the ascending spiral columns of blood;* an arrangement which insures that the delicate margins of the segments are always closely and accurately applied to each other; for the chordæ tendineæ and the blood in the auricles acting from above, while the spiral columns of blood in the ventricles act from beneath, the delicate margins in question are effectually prevented from falling towards the ventriculur walls.[2] This downward action of the valve, musculi papillares, and chordæ tendineæ, which is of essential importance in adapting the former to the diminishing condition of the left auriculo-ventricular orifice and ventricular cavity, continues until the blood is completely ejected, and the segments of the valve are twisted or plaited into each other to form a dependent spiral cone, whose apex is directed towards the apex of the ventricle. By the time this happens, *i. e.*, by the time the blood is ejected from the ventricle, and the cone in question fairly formed, the left auricle is distended; and due advantage being taken of the extra space afforded by the descent of the valve, the blood assumes a spiral and conical or wedge-shaped form, which is the best possible for pushing aside the segments, already in the most favourable position for falling away from the ventricular axis, towards the ventricular walls. The same phenomena are repeated with unerring regularity, with each succeeding action of the heart. What has been said of the manner of closure of the mitral or bicuspid valve, applies, I need scarcely add, with slight modifications to the tricuspid."

J. A. M.

ART. XXIV.—*A Practical Essay on the Use of the Nitrate of Silver in the Treatment of Inflammation, Wounds, and Ulcers.* By JOHN HIGGINBOTTOM, F. R. S., Hon. Fellow of the Royal College of Surgeons of England. Third edition, much improved. John Churchill & Sons, London, 1865. 8vo. pp. 172.

ABOUT the year 1820, Mr. Higginbottom applied, as an experiment, a stick of nitrate of silver to the moist surface of an irritable ulcer on the ulnar side of the third finger of his left hand. A hard black eschar formed which dropped off at the end of six days, leaving the wound healed. The result of this trial induced him to further observe the effects of the substance under analogous circumstances. On the first of January, 1826, he published "An Essay on the Application of the Lunar Caustic in the Treatment of certain Wounds and Ulcers," which embraced the knowledge he had acquired on the subject up to that time. Three years subsequently a second edition was published; but the name nitrate of silver was substituted for lunar caustic, because the author believed that the substance possesses "a peculiar conservative property rather than a caustic one."

Since the publication of the second edition (1829?) he says: "I have employed the remedy daily, and can conscientiously declare that its value has daily increased in my estimation, and that, unlike most remedies proposed by the ardent inquirer in medicine and surgery, it has borne the test of experience in many other hands, as well as my own." He believes that nitrate of silver is more extensively used in America than in England.

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[1] When the segments of the mitral valve are screwed home, the whole force of the ventricular contraction is expended in raising the aortic semilunar valve, and until the screwing home has taken place, the latter action is impossible, as the ventricle up to this point is compressible.

[2] The serious results which might arise from the segments of the valve falling towards the ventricular walls, or away from the axis of the cavity, is especially prevented by the attachments of the chordæ tendineæ; the principal and more internal chordæ tendineæ being, as I have shown, attached to the backs or more external surfaces of the segments, an arrangement which makes their rapid approximation towards the ventricular axis inevitable.

This third edition of the work is dated at Nottingham (England), July 13, 1865, about thirty-six years after the issue of the second.

Mr. Higginbottom complains that "from erroneous views, promulgated in medical and surgical manuals, by different lecturers and authors, totally at variance with the plain, common sense directions and principles laid down in my work," the free use and general adoption of the nitrate of silver have been impeded. An early and great hindrance to its use was a prevalent but erroneous notion that it was a caustic in the ordinary acceptation of the term. He says, "the nitrate of silver is not a caustic in any sense of the word. It subdues inflammation, and induces resolution and the healing process. It preserves rather than destroys the part to which it is applied, even where the skin would inevitably slough but for the extraordinary preservative power of this remedy." Compared with potassa, "we find that hydrate of potassa destroys, and induces a slough, and the ulcerative process; but if we apply to a part the nitrate of silver, the eschar remains adherent for a time, and then falls off, leaving the subjacent parts healed. If an ulcerated surface, secreting pus, be passed over by the nitrate of silver, the purulent discharge is immediately converted into serum; it is the property of the hydrate of potassa, on the contrary, to induce ulceration and suppuration. In short, the peculiar properties of the nitrate of silver have long been concealed by its being thought a caustic, a destructive agent, and being called lunar caustic, affording the most striking instance of the influence of a term or of a classification upon the human mind.

"The nitrate of silver and the hydrate of potassa (as indeed all caustics) are as the poles to each other—the first *preserves*, the second *destroys*. The first induces cicatrization, the second ulceration."

It has been objected to the application of nitrate of silver in erysipelas that, being a constitutional disease, it might cause metastasis, or a determination of the inflammation to internal organs. On this point Mr. Higginbottom says, "I have never entertained such an opinion, nor have I, during more than forty years' experience, seen a single instance, either in erysipelas or any other inflammation, where the application has produced any untoward effects."

He urges that deviations from his method of applying nitrate of silver have hindered its general use. He says: "The proper and simple direction I have given, is: To apply the nitrate of silver over the *whole* of the inflamed surface, and beyond it on the healthy skin; and should the inflammation still spread, to repeat the application until it is quite subdued. This method of treatment has always been successful.

"The other error is in applying the nitrate of silver on the inflamed surface only, neglecting to apply it on the surrounding healthy skin, or to re-apply it when the inflammation spreads."

Notwithstanding that he has been referred to as authority for employing weak solutions of different strengths, he declares: "I have never recommended or used a weak solution in external inflammation, but, as afterwards stated, a concentrated solution of one hundred and sixty grains to one ounce of distilled water." Weak solutions are inefficient to arrest erysipelas, "but quite sufficient to bring the remedy into discredit."

Mr. Higginbottom considers it very important to call the "attention of surgeons to the superiority of the ordinary stick of the nitrate of silver over the new preparation, which has been now used for some time. The new preparation, 'lunar caustic points perfectly tough,' is worthless as an application in surgical cases. "It is not nearly so soluble as the old brittle stick of nitrate of silver, and while possessing scarcely any power to check and subdue inflammation, is quite useless in the cure of wounds. The same remarks apply to the cake and crystals of the nitrate of silver used for photographic purposes, which, although they may be chemically purer, are much less efficacious for surgical purposes than the old preparation."

Mr. Higginbottom claims that until he called attention to it in the year 1829, the influence of this agent in subduing inflammatory action had not been noticed by surgical writers, nor had its unexpected and extraordinary powers been ascertained. This claim seems to be generally conceded by leading writers on materia medica, although all do not concur in his opinion of the value of its application under all the circumstances and conditions for which he confidently recommends it.

His description of his method of using nitrate of silver we copy for the reason that his work may not be reprinted here, and it affords a fair specimen of his style and manner of treating the subject.

"After so many years' additional experience in the use of the nitrate of silver in the treatment of inflammation, wounds, and ulcers, I am anxious to give full and particular directions for its use; for the proper mode of applying this remedy is quite essential to procure its good effect.

"There is no form of acute superficial inflammation, arising from constitutional or mechanical causes, in which the nitrate of silver may not be applied with great safety and advantage. For many years I have used the nitrate of silver, in solution, in proportion as follows, prepared immediately before using it: ℞. Argenti nitratis ℈iv; aquæ destillatæ ʒiv.

"I find the above concentrated solution more convenient for application when it has to be used on a considerable surface, as in erysipelas, &c. It may be applied with a small piece of linen attached to a little stick. It is not only useful for external use, but for application to internal parts of the throat, &c. Precaution should be taken to renew the linen after it has once been used.

"When the solid form of the nitrate of silver is used, it is necessary to moisten the surface to which it is to be applied slightly with pure water, and apply a long stick of the nitrate of silver *flat* upon the moistened surface, taking care that it be applied to every affected part.

"It is necessary for the successful application of the nitrate of silver, that the surface of the skin be free from oleaginous matter, loose cuticle, or any other extraneous substance. The parts should be well washed with soap and water, and afterwards with water alone, to remove any particle of soap remaining, as the soap would decompose the nitrate of silver.

"It is very essential to know the precise effect of the nitrate of silver in the different degrees of its application.

"In some cases of slight external inflammation it is sufficient merely to blacken the cuticle. How this apparently simple process acts in subduing the inflammatory action, I am quite at a loss to determine. But it is my object simply to ascertain and state practical facts. It is plain, however, that a chemical union takes place between the metallic salt and the animal substance, by which its pores are obliterated, and the action of the external air excluded. In other cases the nitrate of silver must be applied more or less freely, according to the degree of inflammation, as follows:—

"The nitrate of silver, either in solution or the stick, may be passed once, twice, thrice, or more times, according to the degree of inflammation; once in slight cases, twice or thrice in common cases, and more frequently on the spots where the inflammation is most intense. On these parts I have applied the stick after the concentrated solution, so as to have the full effect of the remedy. It is necessary to apply the nitrate of silver more on the hand, or sole of the foot, where the cuticle is thick, than on other parts. After the application the part is to be exposed to the air to dry, and is to be kept cool.

"In twenty-four hours, if the nitrate of silver has been properly applied, it will be frequently observed that the inflammation has subsided, and its progress been checked; but if there be an inflamed spot left untouched, the patient will complain of it. To every such spot the nitrate of silver must be applied. At this period there is often a little vesication, which is to be disregarded.

"On the third day there is usually more vesication and less swelling, and the patient complains of a little pain, as of a blister; but on pressure the part has a puffy feeling, and is found quite free from inflammation.

"On the fourth day the vesications begin to disappear. It is best to leave them undisturbed, for the dried exudation and cuticle defend the subjacent cutis.

"On the fifth day the vesicated crusts separate, leaving the subjacent parts free from soreness and inflammation. It is sometimes several days before the whole of these crusts peel off; but it is best to leave them undisturbed."

After many experiments, Mr. Higginbottom adopted the following plan of treating old ulcers of the legs:—

"A patient presents himself with one or more ulcers of the leg, with a dark or purplish surface, deep and hardened edges, fetid smell, attended with inflammation covering perhaps a great part of the leg, with enlargement of the vena saphena, sometimes œdema of the foot—having perhaps not experienced a good night's rest for years—the pain, heat, and itching sensation being dreadfully distressing to him, and his health altogether being much impaired. He is obliged, perhaps, to follow his daily avocation—often in those cases laborious—and in this way may have dragged on a miserable existence for years.

"The first thing I direct my patient to do in such a case is to apply a common bread-and-water poultice, and afterwards to keep it constantly damp with a little cold water, to remain in bed for eighteen or twenty-four hours to allow any swelling of the leg to subside, and to take a dose of aperient medicine; the leg after this to be washed well with soap and water, to free it from any oleaginous substance or loose cuticle; it is then to be wiped dry with a towel. The inflamed part is to be moistened with *soft* water, and the nitrate of silver passed twice over it, and a little beyond it on the healthy skin, and then applied more freely to every part of the ulcer, particularly the edges and skin immediately surrounding.

"A piece of lint is to be put over the ulcers, and linen, spread tolerably thick with neutral ointment,[1] over the whole inflamed and ulcerated parts; a compress of linen and a common calico roller are last of all to be applied, the latter not too tight, but sufficiently so to retain the dressings in their place.

"The patient is obliged to remain a few hours in bed, on account of the pain occasioned by the application of the nitrate of silver; but after this has once subsided, he enjoys more relief than from any other application, and sleeps soundly all night for the first time perhaps for years. The dressings are to be taken off at the expiration of the fourth day, when the inflammation will be found to have nearly subsided, and the ulcer to have a more healthy appearance. If any of the plasters adhere, they may remain until the time of the next dressing. The applications on the ulcer itself are easily removed, as there is usually a free discharge of lymph from its surface, and the neutral ointment is but very slightly adhesive. It will be also observed that there is not the least fetor, owing to the antiseptic property of the nitrate of silver, as it quite prevents the putrefactive process.

"Another dressing similar to the one before may be applied, and this may remain for four days, by which time the sore will usually present a thoroughly healthy character."

This volume, especially when considered in connection with the professional age of the author, is a valuable contribution to medical literature. But it would have been still more valuable had it included also a full account of the internal uses to which nitrate of silver has been applied.

In this work, which embodies more than forty years of the author's experience, Mr. Higginbottom endeavours to establish the following conclusions, and in their support he adduces one hundred and four cases:—

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[1] "*Kirkland's Neutral Ointment.*—℞. Emp. plumbi ℥vj; olei olivæ ℥iij; creta ppt. ℥ivss; aceti destillati ℥iv. The acetic acid and chalk must be well mixed in a mortar, and the lead plaster and olive oil, previously melted together, are to be added. The whole is then to be stirred together until cool. To be kept under a little water."

"Black lint is a very useful application to small ulcers, where there is but little discharge or suppuration; by its absorbing any secretion, an adherent eschar is formed under it, and the ulcers healed.

"The formula for black lint is as follows: ℞. Argenti nitratis ʒij; aquæ destillatæ ℥iv. M. fiat solutio. An ounce of fine lint is saturated with this solution, and then exposed in a flat shallow vessel, to dry by evaporation."

"1. Nitrate of silver is not a caustic or corrosive substance, but, on the contrary, possesses a peculiar conservative property, calculated to preserve, and not to destroy, the animal tissue to which it is applied.

2. When an adherent eschar forms over a recent wound, the wound, under ordinary circumstances, invariably heals.

3. The direful effects of punctures from needles, nails, hooks, thorns, bayonets, saws, &c., are totally prevented.

4. In lacerated wounds the consequent irritation and inflammation are prevented or removed.

5. In recent contused wounds the inflammation is subdued, and consequent suppuration and loss of substance prevented.

6. In phlegmonous inflammation the progress of tumefaction and inflammation is arrested, and suppuration often prevented.

7. In simple acute erysipelas the inflammation is immediately arrested, and quite subdued in four days; when affecting the face and scalp, cerebral inflammation is invariably prevented, and delirium ceases.

8. In phlegmonous erysipelas the inflammation is often arrested, and so far subdued as to prevent extensive sloughing of the cellular tissue; or if suppuration takes place, it is similar to phlegmon.

9. In ulcers the inflammation is removed, suppuration modified, and the healing process greatly facilitated. These effects are very apparent in the treatment of phagedenic ulcers.

10. In large incised wounds, where the interrupted suture is used, inflammation and suppuration are prevented, and the wound heals by the first intention.

11. In variola the early pustule is immediately arrested in its progress, and the pitting of smallpox is entirely prevented.

12. In dissection wounds the specific poison is neutralized, and rendered innocuous, so that all danger is prevented.

13. The healing process by the nitrate of silver is generally facilitated when the parts can be exposed to the air." W. S. W. R.

ART. XXV.—*Contributions to Bone and Nerve Surgery.* By J. C. NOTT, M.D., Professor of Surgery in Mobile Medical College. Philadelphia: J. B. Lippincott & Co., 1866. 12mo. pp. 96.

THIS brochure is intended, the author declares in the preface, "simply as a contribution to a department of surgery which has been strangely neglected, and in which there is a remarkable want of medical literature, viz., the *sequelæ* of gunshot and other injuries of bones." "Writers on military surgery," he says, "have well covered the ground of what might be called *primary* and *secondary* surgery; but here they stop, and we are left to grope our way in the dark in *tertiary* surgery. None of them follow up the shattered and diseased bones for months and years and give us well-defined rules by which we are enabled to treat this large class of tedious, painful, and dangerous gunshot sequelæ."

One half of Dr. Nott's essay is devoted to a succinct *résumé* of those general pathological principles and the rules of practice which are taught in systematic treatises as those by which the surgeon should be guided in dealing with traumatic affections of bone and their consequences. The other half contains his own peculiar views, exemplified by cases that have come under his own observation.

The *résumé* of what is taught in systematic treatises is an excellent one. It must be remarked, however, that systematic treatises do not contain many important observations upon osteo-myelitis and contusion of bone, by which the surgery of the osseous system has been much enriched in the past few years.

The peculiar views of the author, contained in Part II., are set forth clearly, and the cases by which they are exemplified are appropriate and instructive.

In consequence of gunshot wounds, in which the bones have been struck or broken, the surgeon often has to deal with chronic osteitis, caries, necrosis, deformed or voluminous callus, exostoses, and false joint. The presence of foreign bodies, the extreme complication of the fracture, long-continued suppuration, and chronic osteo-myelitis play the chief part in the production of these affections.

Dr. Nott has confined himself almost exclusively to the consideration of the proper treatment of cases of necrosis and of chronic osteitis. The directions given by him for dealing with these troublesome cases are sound, and may be followed with advantage.

As is well known, Dupuytren divides the splinters made by a gunshot wound of a bone into *primary, secondary,* and *tertiary.* It is a convenient division, and one generally followed by surgical writers. The primary are those entirely detached at the moment of injury; the secondary, those incompletely detached, still adhering to muscle, tendon, or aponeurosis; the tertiary are those still adherent to the bone, to be detached, if left, by necrosis. (*Clinique Chirurgicale,* tome 2ième, pp. 457 and 586.) All experienced surgeons are agreed that primary splinters should be at once removed, but they differ as to the proper course to pursue in regard to the others. For instance, Dupuytren himself teaches that they should be left; so also do Percy and Larrey; while Guthrie and Baudens advise their removal. Dr. Nott says that in the latter part of the war he adopted a very different practice from that he followed at the beginning, and became much less scrupulous in leaving fragments *in sitû,* and was astonished at the manner in which nature would solder them together. The conclusion we reached, from our own experience, was just the contrary.

In the sixteenth volume of the *Memoirs of the Académie de Médecine* (1852) is a memoir by Hutin, Chief Surgeon of the Hôtel des Invalides, which is entitled: "On the Necessity of Extracting Foreign Bodies and Splinters in the Treatment of Gunshot Wounds." It is an admirable memoir, and shows, we think, very clearly, that the elimination of secondary splinters is always painful, often dangerous, and sometimes fatal. While, when immediately extracted, recovery is incomparably more rapid. It may be remarked on this occasion that Dr. Nott believes the climate of the Southern States to be peculiarly favourable to wounds. He feels assured that no experience of the old world can compare, in success (in gunshot fractures) with that of the surgeons of the Southern States, not from any peculiar skill on their part, but from the superiority of the climate. (p. 80.)

Two interesting cases of affection of the nerves—one of neuralgia of the stump after amputation, the other of a neuromatous encysted tumour of immense size—are recorded in an addendum. W. F. A.

ART. XXVI.—*On Wakefulness; with an Introductory Chapter on the Physiology of Sleep.* By WILLIAM A. HAMMOND, M. D., Fellow of the College of Physicians of Philadelphia; Member of the Philadelphia Pathological Society, etc. etc. Philadelphia: J. B. Lippincott & Co., 1866. 12mo. pp. 93.

THE basis of this little volume may be found in an essay "On Sleep and Insomnia," published by the author in the May and June issues of the *New York Medical Journal* of 1865.

Dr. Hammond teaches that "the *immediate* cause of sleep is a diminution of the quantity of blood circulating in the vessels of the brain, and that the *exciting* cause is the necessity which exists that the loss of substance which the brain has undergone, during its state of greatest activity, should be restored." This doctrine, he sustains, by reference to the history of a case, under his observation in 1854, of a man who had lost eighteen square inches of his skull, in whom the scalp was depressed, while asleep, where the bone was absent, and at the instant of waking rose to a higher level. Subsequently he "observed that in young infants the portion of scalp covering the anterior fontanelle was always depressed during sleep, and elevated during wakefulness." In 1860, with a view to ascertain the condition of the cerebral circulation during sleep, he experimented on dogs, by removing portions of skull by the trephine; and quite recently he performed analogous experiments in order to determine the condition of the circulation in the brain under the influence of opium. He refers to records of observations by others in corroboration of his own conclusions; and states that Blumenbach proposed, in a somewhat different form, the theory of sleep now enunciated, but physiologists have not received it with favour.

"But," says Dr. Hammond, "the most philosophical and most carefully digested memoir upon the proximate cause of sleep, which has yet been published, is that of Mr. Durham.[1] Although my own experiments in the same direction, and which will be hereafter detailed, were of prior date, I cheerfully yield all the honour which may attach to the determination of the question under consideration to this gentleman, who has not only worked it out independently, but has anticipated me several years in the publication, besides carrying his researches to a much further point than my own extended."

The pathology, exciting causes, and treatment of wakefulness are discussed in an agreeable and satisfactory manner by the author, and we commend his monograph to the profession as a useful addition to medical literature.

W. S. W. R.

ART. XXVII.—*Annual Report of the Surgeon-General United States Army.* 1865, 8vo. pp. 7. Washington, 1865.

THIS brief but interesting report contains some important statements which we take pleasure in placing before our readers, as showing the efficiency of the medical service during the war and the creditable manner in which our brethren performed all their duties.

"The ample provision for sick and wounded existing at the date of my last Annual Report," the Surgeon-General states, "was increased during the ensuing months until a maximum of (204) two hundred and four General Hospitals, with a capacity of (136.894) one hundred and thirty-six thousand eight hundred and ninety-four beds was reached. Field hospitals, hospital transports and cars, ambulance corps, and the purveying depots, were kept in condition to meet all possible requirements, and General Sherman's army was met at Savannah by four first class sea going steamers, thoroughly equipped as hospital transports, with extra stores and supplies for five thousand beds, should it have become necessary to establish large hospitals upon his line of operations." * * *

"Since April, 1861, there have been appointed (547) five hundred and forty-seven Surgeons and Assistant Surgeons of Volunteers:

"Mustered into service (2109) two thousand one hundred and nine Volunteer Regimental Surgeons, and (3882) three thousand eight hundred and eighty-two Volunteer Regimental Assistant Surgeons;

"Employed as Acting Staff Surgeons (75) seventy-five, as Acting Assistant Surgeons (5532) five thousand five hundred and thirty-two.

"As far as returns have been received, during the war (34) thirty-four officers of the Medical Staff have been killed, or died of wounds received in action, (24) twenty-four wounded, and (188) one hundred and eighty-eight have died from disease or accident incurred in the service; (1) one died in a rebel prison, (6) six of yellow fever. A completed record will increase this number.

"Two hundred and fourteen (214) Surgeons and Assistant Surgeons of Volunteers, reported as supernumerary, have been mustered out." * * *

"The returns of sick and wounded show that of white troops, (1,057.423) one million fifty-seven thousand four hundred and twenty three cases have been treated in General Hospitals alone, from 1861 to July 1, 1865, of which the mortality rate was 8 per cent. In addition to the alphabetical registers of dead, not yet fully completed, the records of the Medical Department contain (30,000) thirty thousand special reports of the more important forms of surgical injuries, of disease, and of operations. These reports, with statistical data, and a pathological collection numbering (7630) seven thousand six hundred and thirty specimens, furnish a mass of valuable information, which is being rapidly arranged and tabulated as a Medical and Surgical History of the War, for the publication of the first volumes of which an appropriation will be asked.

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[1] The Physiology of Sleep. By Arthur E. Durham, Guy's Hospital Reports, 3d series, vol. vi., 1860, p. 149.

"In this connection, and as illustrating more in detail the importance of this work, the Army Medical Museum assumes the highest value. By its array of indisputable facts, supported and enriched by full reports, it supplies instruction otherwise unattainable, and preserves for future application the dearly bought experience of four years of war. Apart from its great usefulness, it is also an honourable record of the skill and services of those medical officers whose contributions constitute its value, and whose incentive to these self-imposed labours has been the desire to elevate their profession. A small appropriation has been asked to continue and extend this collection." * * *

"In nearly all sections of the country the health of the troops has been fully equal to that of the preceding years, though military movements of unprecedented magnitude have been pushed to successful termination without regard to seasons. An epidemic of yellow fever prevailed at Newbern, N. C., in September, October, and November, 1864, causing (278) two hundred and seventy-eight deaths among the troops stationed there, of whom (571) five hundred and seventy-one were attacked. The released or exchanged prisoners arriving at Wilmington, N. C., from rebel prisons, suffered from an epidemic of typhoid fever, which, however, was arrested by strict attention to hygienic rules and prompt transfer to northern hospitals. With these exceptions no serious epidemics have appeared, and it is interesting to note that quarantine regulations strictly enforced by military authority, have proven, during the occupation of southern seaports and cities by our troops, to be an absolute protection against the importation of contagious or infectious diseases. In view of the apprehensions entertained in regard to the Asiatic Cholera, now devastating the shores of the Mediterranean, this becomes a significant fact."

The Surgeon-General bears the following generous testimony to the honourable manner in which our professional brethren performed their duties.

"In conclusion, I desire to bear testimony to the ability, courage, and zeal manifested throughout the war by the Officers of the Medical Department under all circumstances and upon all occasions. With hardly an exception they have been actuated by the highest motives of national and professional pride, and the number who have been killed and wounded bears most honourable testimony to their devotion to duty on the field of battle.

"To the Medical Directors of Armies in the Field and of Military Geographical Departments, especial praise is due for the successful execution of their arduous and responsible duties."

ART. XXVIII.—*The Student's Book of Cutaneous Medicine and Diseases of the Skin.* By ERASMUS WILSON, F. R. S. 8vo. pp. 445. New York, 1865: W. Wood & Co.

THE larger work of Mr. Wilson upon diseases of the skin has been pronounced to be far more scientific and practical than any that had previously appeared. We have, unquestionably, other valuable treatises on the cutaneous maladies, but compared with that referred to, they are far inferior as a safe and intelligent guide to the classification, diagnosis, and treatment of these diseases. In the volume before us Mr. Wilson has endeavoured to supply a want long felt in medical literature—a reliable manual of dermatology for the especial use of the student—sufficiently elementary, and at the same time sufficiently clear and accurate to serve as a faithful guide to the study of the more complete and elaborate systematic treatises upon this most important branch of medicine.

The author having, in the preparation of the work before us, brought to the task the personal experience of years devoted to a careful and cautious study of cutaneous diseases, with a view to determine the soundest principles in respect to their pathology, and the most correct and successful plans for their eradication, is a sufficient guarantee for its satisfactory accomplishment.

For the legitimate purposes of a manual of cutaneous maladies, we know of no work superior to that before us. The author has succeeded in disembarrassing the entire subject of much, if not all the confusion into which it has been for so long a period involved. In all his teachings he is clear and definite—whether in his descriptions of the symptoms peculiar to each form of cutaneous disease, its progress, its pathology, or its proper treatment as derived from the results of clinical experience. His teachings are given, it is true, in bold outline; an outline, however, that may be readily filled up by a more extended course of study, either in the monographs or treatises for which we are indebted to those who have devoted themselves for many years to the investigation of the pathology and therapeutics of the skin, or from clinical lectures especially devoted to an elucidation of these subjects.

Unfortunately, dermatology has been, heretofore, treated as a speciality, apart from the scope of medicine proper; it is in consequence of this, that so little accurate knowledge is to be met with among practitioners generally, in respect to the causation, diagnosis, and treatment of the maladies of the skin; every effort made, therefore, towards restoring to general medicine a most important and frequent class of diseases, such as is done in the present and the other writings of Mr. Wilson, is worthy of all praise.

The necessity of a thorough acquaintance with the physiology of the skin in health, previously to the study of its diseases, is recognized by Mr. Wilson. Consequently, he has preceded the chapters devoted to the consideration of the twenty-two groups into which he arranges the cutaneous affections, by a sketch of the anatomy and physiology of the skin, followed by a chapter on its general pathology, and the classification of its several morbid conditions. D. F. C.

ART. XXIX.—*On the Diseases, Injuries, and Malformations of the Rectum and Anus; with Remarks on Habitual Constipation.* By T. J. ASHTON, formerly Surgeon to the Blenheim Dispensary, etc. etc. With Illustrations. Second American from the Fourth and Revised English Edition. Philadelphia: Henry C. Lea, 1865. 8vo. pp. 287.

IT affords us pleasure to announce the publication of a new edition of the admirable work of Mr. Ashton, which has been thoroughly revised, and further observations and cases added. It is the most complete treatise on the subject accessible to American physicians; and it may be relied on as a safe guide by the practitioner in the treatment of a class of cases of frequent occurrence, and which, when not well managed, are productive of great distress to the patient.

ART. XXX.—*Lectures on the Diseases of Infancy and Childhood.* By CHARLES WEST, M.D., F.R.C.P., Physician to the Hospital for Sick Children. Fourth American from the Fifth Revised and Enlarged English Edition. Philadelphia: Henry C. Lea, 1866. 8vo. pp. 655.

WHEN it is stated that this work has passed through five editions in England, four in this country, and a like number in Germany, and that it has been translated into German, Danish, Dutch, Russian, and French, all commendation of it at this time would be supererogatory. It has now become an established classic in medical literature.

The present edition embodies, the author tells us, the results of 1200 recorded cases, and of nearly 400 post-mortem examinations, collected from between 30,000 and 40,000 children, who, during the past twenty-six years, have been under his care in public and private practice.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *The Functions of the Nucleus.*—A very curious paper has been read before the French Academy by M. BALBIANI. This naturalist, so well known for his splendid researches on the infusoria, contends that cells have a sort of vital individuality. They manifest phenomena of movement and sensibility. They are the seat of considerable nutritive activity, and the nucleus is the principal centre of this activity. M. Balbiani alleges that this activity depends upon the existence of canals like those which are in relation with the contractile vesicle of infusoria, and which serve for the distribution of liquids in the interior of their parenchyma. By the discovery of these canals, M. Balbiani believes that he has found the existence of an actual circulation of fluids in the elementary parts of the animal organism. The animal in which he has observed the structures referred to is a myriapod. M. Balbiani's observations will, we imagine, require much corroboration before they are accepted.

2. *Decomposition of Air by the Tissues.*—An essay on this subject was presented to the French Academy at one of its late sittings. The author, M. DEMARQUAY, has examined the atmospheric air in all parts of the organism in the open and closed cavities, and in the normal and diseased conditions of the system. He draws from this investigation the general conclusion that air rapidly undergoes decomposition when in contact with the tissues, oxygen is absorbed and disappears, nitrogen is left unacted on, and carbonic acid is evolved. The influence of each of these constituents of the atmosphere has been carefully examined.—*Lancet*, Feb. 10, 1866.

3. *Production of Animal Heat.*—M. BERTHELOT advances some views which differ from the theory of Liebig relative to the source of heat in the body. His memoir has been published in the last volume of the *Mémoires de la Société de Biologie*, and may be read with advantage by physiologists. The author thinks that the changes of *hydration* and *dehydration* which organic substances undergo are entirely concerned in the production of heat, and this view he considers of the more importance from the fact that most of the alimentary substances are capable of exhibiting phenomena of this kind. He arranges these substances in three groups—(1) the fatty matters, (2) the carbo-hydrates, and (3) the albuminoid substances. The albuminoid substances are *amides*, and as such give rise to heat by their hydration with decomposition, and their dehydration with combination. The hydrates of carbon (sugar, starch, etc.) produce heat by their decomposition alone, independent of all oxidation. Finally, the neutral fatty matters disengage heat by their decomposition and by simple hydration.—*Ibid.*

4. *Existence of Glycogen in the Tissue of Entozoa.*—In an important paper published in the last number of the *Proceedings of the Royal Society*, MICHAEL FOSTER, M. B., states that he has found glycogen in the substance of the tapeworm and in that of the round worm of the pig (*Ascaris lumbricoides*). The most remarkable fact in connection with this discovery is the circumstance that an animal which lives in a fluid whose especial quality is the conversion of starch into sugar, should, nevertheless, possess the power of amassing glycogen within its own body. There is no sugar-forming ferment in the bodies of the entozoa examined by Mr. Foster. From this fact the writer infers that, if the animal swallows the intestinal juice in which it lives, the sugar-forming ferment contained therein either does not pass through its intestinal wall into its visceral cavity, or, if it does pass, it is at once destroyed. It is evident that the formation of glycogen in the Ascaris takes place under conditions very different from those under which glycogen is deposited in the mammalian liver, since there is a powerful sugar-forming ferment in the latter.—*Lancet*, Feb. 10, 1866.

MATERIA MEDICA AND PHARMACY.

5. *New and Ready Mode of Producing Anæsthesia.*—Dr. B. W. RICHARDSON has been for some years engaged in researches for the production of local anæsthesia. Snow maintained that all narcotics produce anæsthesia by the process of arresting oxidation. Dr. B. has come to the conclusion that arrest of oxidation means arrest of motion, and that anæsthesia in truth means the temporary death of a part, *i. e.*, inertia in the molecules of the part. This led him to the conclusion that Dr. Arnott's plan of using extreme cold was the first true step in the progress of discovery, and that if it could be made easier of application and at the same time could be combined with the use of a narcotic fluid an important advance in therapeutics would necessarily follow. Dr. R. has been for four years engaged in experimenting with a view of demonstrating this. Finally he has devised an apparatus consisting "simply of a graduated bottle for holding ether; through a perforated cork a double tube is inserted, one extremity of the inner part of which goes to the bottom of the bottle. Above the cork a little tube, connected with a hand bellows, pierces the outer part of the double tube, and communicates by means of the outer part, by a small aperture, with the interior of the bottle. The inner tube for delivering the ether runs upwards nearly to the extremity of the outer tube. Now, when the bellows are worked, a double current of air is produced, one current descending and pressing upon the ether forcing it along the inner tube, and the other ascending through the outer tube and playing upon the column of ether as it escapes through the fine jet. By having a series of jets to fit on the lower part of the inner tube, the volume of ether can be moderated at pleasure; and by having a double tube for the admission of air, and two pairs of hand bellows, the volume of ether and of air can be equally increased with pleasure, and with the production of a degree of cold six below zero.

"By this simple apparatus, at any temperature of the day and at any season, the surgeon has thus in his hands a means for producing cold even six degrees below zero; and by directing the spray upon a half-inch test-tube containing water he can produce a column of ice in two minutes at most. Further, by this modification of Siegle's apparatus he can distribute fluids in the form of spray into any of the cavities of the body—into the bladder, for instance, by means of a spray catheter, or into the uterus by an uterine spray catheter.

"When the ether spray thus produced is directed upon the outer skin, the skin is rendered insensible within a minute; but the effects do not end here. So soon as the skin is divided the ether begins to exert on the nervous filaments the double action of cold and of etherization; so that the narcotism can be extended deeply to any desired extent. Pure rectified ether used in this manner is entirely negative; it causes no irritation, and may be applied to a deep wound, as I shall show, without any danger. I have applied it direct to the mucous membrane of my own eye, after first chilling the ball with the lid closed.

"I have now employed this mode of producing local anæsthesia in four cases on the human subject. The first case was the extraction of a tooth from a lady, the operation being performed by my friend and neighbour Dr. Sedgwick, on January 24th of this year. On the 29th of the same month I used it again on the same lady for the extraction of three very difficult teeth, Dr. Sedgwick again operating. The results were as satisfactory as in the previous case, where the ice and salt ether apparatus was used.

"I have used the apparatus also in connection with my friend Mr. Adams, who had a case at the Great Northern Hospital of deep dissecting abscess in the thigh of a young woman. In the abscess there was a small opening, which just admitted the director. I first narcotized around this opening, and the director being introduced, Mr. Adams carried his bistoury nearly an inch deep and one inch in the line of the director. I then narcotized the deep-seated parts, and enabled him to cut for another inch and a half in the same direction. The director was then placed in the upper line of the abscess, the process was repeated, and the incision was carried two and a half inches in that direction. The patient was entirely unconscious of pain, and after narcotizing the whole of the deep surface, Mr. Adams inserted his fingers and cleared out the wound without creating the slightest evidence of pain.

"Afterwards, in the case of a lacerated wound, six inches long, in the arm of a boy, who had been injured with machinery, I narcotized while six sutures were introduced by Mr. Adams. The first needle was carried through without the anæsthetic, and caused expression of acute pain; the remaining eleven needles, after a few seconds' administration of the ether spray, were passed through painlessly. The twisting of the wire sutures gave no pain.

"These results are so interesting that I make no apology for bringing them at once before my medical brethren. I wish it to be distinctly understood that at the present moment I only introduce the method here described for the production of superficial local anæsthesia. It is, I believe, applicable to a large number of minor operations, for which the more dangerous agent chloroform is now commonly employed—I mean such operations as tooth extraction, tying nævus, tying piles, incising carbuncles, opening abscesses, putting in sutures, removing small tumours, removing the toe-nail, dividing tendons, operating for fistula, removing cancer of the lip, and other similar minor operations which I need not mention. The process may also be applied to reduce local inflammation.

"In course of time, and guided by experience and the advancement of science, we may, however, expect more. If an anæsthetic fluid of negative qualities, as regards irritation of nerve, and which has a boiling point of 75° or 80°, can be obtained from the hydrocarbon series, the deepest anæsthesia may be produced, and even a limb may be amputated by this method. It may also turn out that certain anæsthetics may be added to the ethereal solution with advantage, such as small quantities of chloroform, or some of the narcotic alkaloids, if they could be made soluble in ether. A solution of morphia and atropia combined, if they could be diffused through ether, which at present seems impossible, could thus be brought into action so as to cause deep insensibility. In operating on the extremities it would be good practice to stop the current of warm blood by making pressure above on the main artery.

"Reaction from the anæsthesia is in no degree painful, and hemorrhage is almost entirely controlled during the anæsthesia.

"One or two precautions are necessary. It is essential, in the first place, to use pure rectified ether; methylated ether causes irritation, and chloroform, unless largely diluted with ether—say one part in eight—does the same."—*Med. Times and Gaz.*, Feb. 3, 1866.

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6. *Anæsthetic and Sedative Properties of Bichloride of Carbon or Chlorocarbon.*—At different times Professor SIMPSON has inhaled the vapours of various fluids with a view of ascertaining their anæsthetic or other therapeutic properties, but found them inferior to either chloroform or other. Lately he states

(*Med. Times and Gaz.*, Dec. 16, 1865) he has inhaled and used a liquid, the vapour of which seems to him to approach nearer in its quality and effects to chloroform than any other anæsthetic agent. This fluid, the bichloride of carbon or chlorocarbon, is a transparent colourless fluid having an ethereal and sweetish odour, not unlike chloroform. Its specific gravity is great, being as high as 1.56, whilst chloroform is 1.49. It boils at 170° Fahrenheit, the boiling point of chloroform being 141°. The density of its vapour is 5.33, that of chloroform being 4.2.

"Besides trying the anæsthetic effects of bichloride of carbon upon myself and others, I have used it in one or two cases of midwifery and surgery. Its primary effects are very analogous to those of chloroform, but it takes a longer time to produce the same degree of anæsthesia, and generally a longer time to recover from it. Some experiments with it upon mice and rabbits have shown this—two corresponding animals in these experiments being simultaneously exposed under exactly similar circumstances, to the same doses of chloroform and chlorocarbon. But the depressing influence of chlorocarbon upon the heart is greater than that of chloroform; and, consequently, I believe it to be far more dangerous to employ as a general anæsthetic agent. In a case of midwifery in which it was exhibited by my friend and assistant, Dr. Black, and myself, for above an hour, with the usual anæsthetic effects, the pulse latterly became extremely feeble and weak. In another case in which it was exhibited by Dr. Black, the patient, who had taken chloroform several times before, was unaware that the new anæsthetic was different from the old; her pulse continued steady and firm, although she is the subject of valvular disease of the heart. The surgical operations in which I have used chlorocarbon have been, the closure of a vesico-vaginal fistula, the division of the cervix uteri, the enlargement of the orifice of the vagina, and the application of potassa fusa to a large flat nævus upon the chest of a young infant. In all these cases it answered quite well as an anæsthetic. The child did not waken up for more than an hour and a half after the employment of the caustic, which was used so as to produce a large slough. Its pulse was rapid and weak during the greatest degree of anæsthetic sleep. One of the mice exposed to its influence, and which was removed from the tumbler where the experiment upon it was made as soon as the animal fell over, breathed imperfectly for some time after being laid on the table, and then died.

"Chlorocarbon, when applied externally to the skin, acts much less as a stimulant and irritant than chloroform, and will hence, I believe, in all likelihood, be found of use as a local anæsthetic in the composition of sedative liniments.

"In two cases of severe hysteralgia I have injected air loaded with the vapours of chlorocarbon into the vagina. The simplest apparatus for this purpose consists of a common enema syringe, with the nozzle introduced into the vagina, and the other extremity of the apparatus placed an inch or more down into the interior of a four-ounce phial, containing a small quantity—as an ounce or so—of the fluid whose vapour it is wished to inject through the syringe. Both patients were at once temporarily relieved from the pain. The first patient told me her relief at the first application of the anæsthetic vapour was so long that she slept during the following night far more soundly than she had done for weeks previously.

"The injection of the vapour of chlorocarbon into the rectum does not prove so irritating as the vapour of chloroform. In one case it removed speedily pains in the abdomen and back.

"Chloroform vapour applied by sprinkling a few drops on the hand, and held near the eye, is one of the very best and most sedative collyria in some forms of conjunctivitis, ulcerations of the cornea, with photophobia, etc. I have not yet tried the vapour of chlorocarbon, but perhaps it may answer still better, as less irritant, and almost as strongly sedative.

"I have found ten or twenty drops injected subcutaneously by Dr. Wood's syringe repeatedly relieve local pains of the walls of the chest, abdomen, etc., without being followed by the distressing nausea so frequently the result of the hypodermic injection of preparations of opium and morphia.

"Internally I have only hitherto tried it in small doses in gastrodynia, where it has the same effect as swallowing a capsule of chloroform."

7. *Solanum Paniculatum.*—In the *Bulletin Général de Thérapeutique* (Jan. 15th), M. Stanislas Martin describes a new medicinal substance under the title of *jurubeba*, the term applied in Brazil to a plant called by botanists *Solanum paniculatum.* In South America the plant is used in the form of emplastrum, syrup, wine, tincture, and aqueous and alcoholic extract. It is chiefly employed in affections of the liver and spleen, in vesical catarrh, anæmia, chlorosis, and difficult menstruation. According to the testimony of several observers, this new drug promises to be the most powerful deobstruant yet met with. The jurubeba is sold commercially in the state of leaves, fruit, and roots. The latter vary in length from ten to fifty centimetres. They are covered with minute rootlets; their texture is hard and fibrous, the fibres being serrated. The stems of the plant are long and slender, and are studded with sharp-pointed prickles. The leaves attached to them have a fine green colour; they are without odour, and are nearly tasteless.—*Lancet*, Feb. 10, 1866.

8. *Physiological Action of Iron.*—A new theory of the action of iron upon the system has been started by Dr. A. Sasse, in a paper reported in Schmidt's *Jahrbücher.* This *savant* considers that the salts of iron replace, as it were, the blood-globules by acting as carriers of ozone. It is of no importance whether the iron be administered as an oxide, a per-salt, or a proto-salt; for, when once it has entered the circulation, it continually takes up and gives off ozone till it is expelled from the body. Dr. Sasse concludes that we have in iron a means of promoting the process of oxidation; but we should never administer this medicine except in cases where the process of oxidation is not sufficiently energetic. He considers that iron should not be employed in tuberculosis.—*Ibid.*

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

9. *The Polymorphism of Disease.*—It is manifest that living beings, animals, plants, and even chemical bodies, wander considerably from their ideal pristine type; the degree of variation, as the rule, being in direct ratio to the simplicity of organization. At the same time, as a salutary check to ultra interpretations, there is a law of limitation, in virtue of which species preserve each their *essential*, though they may vary as regards *accidental*, features.

The best exemplification of this truth is afforded by components of the vegetable kingdom, the whole of which, as Dr. Hooker truly observed, is pervaded by the element of mutability; and no better illustrations are afforded than by the history of the potato, of wheat, and of garden flowers in general. Analogous instances in the animal kingdom in the lowest forms of life are referred to by Quatrefages in his "Metamorphoses of Animals," and illustrated by the facts of "the alternation of generations." When this theory was first promulged, the word Di-morphism was coined, used timidly, then more frequently and freely, and now has given place to the more correct designation—polymorphism. Very admirable examples are given by De Barry, who has shown that *uredo uromyces*, *puccinia* and *æcidium* are but stages of the same coniomycetous fungus. It would appear also that there are from four to six aspects of pyrenomycetes, and the third volume of Tulasne's "Carpologia" contains similar evidence in his magnificent plates of polymorphism in the entomogenous *spheriæ*, and other allied groups; and as fructification has been regarded as the only real differential test of species in fungi, it is easy to understand that the natural variations of one have been looked upon as separate and distinct kinds of plant. In the mineral kingdom, the same condition is confirmed by the behaviour of certain crystalline salts. In the animal kingdom, the principle of natural selection interferes somewhat. Many of the various species of acari are thought mere modifications, to be accounted for by the influence of differences of habitat and the like.

No less is polymorphism exhibited in the case of diseased conditions. The instances of intestinal and other entozoa will at once occur to the mind. There is scarcely a disease which has not a considerable range in aspect according to the different degrees of intensity in quality or quantity of the virus, and the state of the living being upon whom it plays; hence the varying character of epidemics—malignant, sthenic, asthenic, fatal, or mild. As the local expressions of disease depend, of course, upon the degree of development of the general condition, variations are met with accordingly, and this is an important consideration at the present time in reference to Rinderpest. It is asserted that the chief objection to the reception of belief in its identity with smallpox exists in the contrasts presented by the eruption in the two cases. Is the affirmative consistent by analogy with what we know of diseases in general? Variola, vaccinia, and cowpox are now admitted to be identical in nature. Bastard vaccinia must be included also; and the French have adduced evidence in support of the view that grease and aphthous stomatitis of horses are modifications of variola; whilst in India the latter, as to its eruption, assumes unusual garbs in man and animals. Puerperal fever may be erysipelatous, gastro-enteric, or malignant. Measles may be mild (as in the East), malignant, abortive, as in Rubeola sine catarrho, or anomalous, as Rubeola notha, and the pseudo-measles of Dr. Salisbury. Scarlatina is peculiarly mild in the puerperic woman in Ireland; and its least expressed form is not unlikely Rosalia. In northern climates leprosy assumes the tubercular, and in India the anæsthetic form by preference; whilst in mid-climes one occasionally observes its least expression, Morphœa, as the total disease. In Scotland Sibbens is its remnant. Syphilis is mild in the East, bad in India; and Radesyge is supposed by Dr. Böeck to be a peculiar phase in Norway. The distinctions of gout, rheumatic gout, and rheumatism are not well defined. Gonorrhœal rheumatism is a puzzle as to its exact relations. Turning, however, to examples that are more immediately appreciable by the eye, and, therefore, not so likely to mislead—viz., eruptions on the surface, we observe the same polymorphism in acute specific diseases; for some early stages may represent the total malady. This opens out the wide question of "abortive forms" to which Dr. Stokes especially directed attention. In typhoid fever we frequently notice certain special characters peculiarly marked, as in the "latent" cases. Erratic and metastatic occurrences are further illustrative. Amongst the more chronic maladies, there is no dearth of examples. Eczema is rarely observed to be vesicular; fissuring, squamation, papulation, or even erythema, may predominate, or a translation of morbid action to the mucous membranes may take place, and alternate with the changes usually noted on the surface. Strophulus in its several forms, and lichen, the whole parasitic group of diseases, and the phases of scabies only confirm what has been said. Age, sex, constitution, texture (*e. g.*, the hairy covering of animals), the transmission through different species, hereditary peculiarities are some of the chief agencies in effecting modification; and in reference to hereditary peculiarities, it is worth noting that in eruptions the local changes are peculiarly well marked and obstinate.

The duty of the scientific man is clearly indicated by the often repeated words of Mr. Bentham in reference to plants—"That neither size nor outline affords any basis for distinction into species until it has been ascertained, from extensive comparison of forms brought from different localities in the widest area over which the species can be traced, what are the average characters of the type and what is their range of variation." The doctrine of polymorphism is an important one to be aware of, since the various influences that play upon the individual differ much at and in different times and places; and whilst close similarities are often produced, it is all the more needful that diseases should be studied in their entire history, and that no one special feature be exalted into undue significance, if we would travel the safest road in the discovery of truth.—*Med. Times and Gaz.*, Jan. 20, 1866.

10. *Medical Statistics.*—Claude Bernard, in his *Introduction à l'Etude de la Médecine Expérimentale*, just published, gives us his views as to the value of statistics in medicine. The opinions of such a man on such a subject will interest most of us.

There are (he says) political, social, and medical theorists among whom statistics have a sort of mysterious veneration. Everything can be proved by statistics. It is a convenient way of getting rid of troublesome facts and of presenting hypotheses in an imposing form. Thus, when the number of pulsations are measured by an instrument throughout the day, and an average is taken of the varying numbers, "on aura précisément des nombres faux." The figures are exact, the average is an error, for it represents no actual condition. The pulse diminishes during the intervals of fasting, accelerates during digestion, and varies continually according to other influences, such as movement and repose; all these biological peculiarities disappear in the average. In like manner, when averages are struck from calculations respecting secretions, there is a mingling together of the most varying conditions; a secretion which is alkaline at one moment is acid at another; in the average it appears a compound of the two. When a physician collects a number of cases and from them draws up a description which represents the symptoms on an average, he describes that which never existed in nature.

This error of averages is strikingly exhibited in the various theories of food propounded by physiologists. The amount of oxygen, or any other substance, consumed by an animal in one day is estimated and compared with the weight of the animal; but the weight represents a total of various substances with which the oxygen has very various relations, some of them being totally unaltered by the oxygen, others profoundly affected by it. In like manner, a poison is estimated according to the amount required to kill an animal of a certain weight. "Il faudrait pour être plus exact calculer non par kilo du corps de l'animal pris en masse, mais par kilo du sang et de l'élément sur lequel agit le poison." But even then the mere weight tells us little. Other conditions interfere, and these, which vary with the age, size, sex, state of digestion, etc., of the animal, determine the effect of the poison.

Obviously, the first condition of statistical comparison must be that the facts compared are exactly observed and are capable of being reduced to unities comparable with each other. How often is this condition present in medical statistics? Every one familiar with hospitals knows what numerous causes of error have vitiated the reported "cases." Very often the diseases have been named at hazard after a superficial diagnosis; and even when the cases have been carefully examined, no two precisely resemble each other; age, sex, temperament, the complication of other diseases, and a crowd of circumstances interfere; and if this is so with two cases, how much more will it be with a hundred! The average is supposed to eliminate all these differences; but whenever the physician has a case before him, that case is individual, not an average; its peculiarities are not eliminated, yet on its peculiarities must depend the effect of his treatment.

M. Bernard reminds us that it is only when the cause is quite undetermined that any one thinks of applying statistics. No one enumerates cases in which oxygen and hydrogen compose water; no one counts the number of times in which division of a nerve paralyzes its muscles. It is only when the cause is unknown that cases are counted, and then the enumeration throws no light on the conditions. For example: some experiments showed that the anterior roots of the spinal nerves were insensible; other experiments showed that they were sensible; would it have thrown any light on this difficulty to say that the law of sensibility in the spinal roots is that of 25 per 100? Or ought we to invoke "la loi des grands nombres," and say that the roots are as often sensible as insensible? It would be absurd. There is obviously a reason why they are sensible, a reason why they are not, and it is these reasons we are to discover.

A great surgeon performs an operation many times; he then gives a tabular statement of the cases which have been fatal and the cases which have been successful, and statistically concludes that the mortality of this operation is two in five. What will this tell us respecting the certainty of the next case? We cannot know whether it will be one of the two or one of the three. We ought to know what are the conditions which will range it infallibly under one or the other head. Instead of an idle enumeration, we should make a fruitful study of each special case, and discover, if possible, the cause which renders the operation fatal. The same reasoning applies to curative remedies. A certain remedy has in twenty instances been followed by a cure; in seven instances no cure has been effected. You will say, perhaps, that there is twenty to seven in favour of success. Not in the least. You do not know how many of those twenty patients would have recovered had there been another remedy tried, or no remedy at all; you do not know what was the precise action of the remedy, what changes it effected in the organism, what its effects will be on the organism now about to be submitted to it. As a great mathematician observed, "La loi des grands nombres est toujours vraie en général et fausse en particulier." And as to the "compensations which bring about the law," they are useless in medicine. Mathematicians admit that if a red ball has come up fifty times in succession, that is no reason why the white should come up on the fifty-first; the white ball is certain to come up some time or other, but its appearance depends on specific conditions which have nothing to do with what has gone before.

Is there, then, no utility in statistics? M. Bernard is far from saying so. He admits that statistical results lead to probabilities and suggest research; but he protests against the idea that medicine must be only conjectural. He insists on the necessity for a scientific basis, and declares that every method of treatment which is not grounded on a clear recognition of the causal connections between agents and the organism is mere empiricism, not much removed from charlatanism. "Les médecins en général semblent croire qu'en médecin il y a des lois élastiques et indeterminées. Ce sont là des idées fausses qu'il faut faire disparaître si l'on veut fonder la médecine scientifique. La médecine, en tant que science, a nécessairement des lois qui sont précises et déterminées, qui, comme celles de toutes les sciences, dérivent du critérium expérimental."—*Brit. Medical Journal*, Dec. 16, 1866.

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11. *Morbid Anatomy and Early Physical Signs of Pneumonia.*—Dr. T. H. WATERS read (Dec. 12, 1865) a paper on this subject before the Royal Medical and Chirurgical Society.

He states that "although the conditions which characterize pneumonic inflammation—engorgement, red hepatization, and gray hepatization—have been accurately described by various pathologists, discrepancy of opinion exists on some points connected with the morbid anatomy of the disease, such as, 1st, the bloodvessels involved in the inflammation; 2d, the particular part of the pulmonary substance which is the seat of the disease. These points can only be cleared up by a careful comparison of the healthy with the pneumonic lung. With regard to the bloodvessels involved in pneumonia, the opinions of pathologists are divided. Some believe that the capillaries of the pulmonary artery are those essentially affected, those of the bronchial arteries being most probably also involved; some consider the bronchial capillaries mainly concerned; while others think it probable that both sets of vessels are simultaneously affected, although perhaps in different degrees. In considering this question it is necessary to examine into the arrangement of the bloodvessels of the lungs, to define clearly the parts to which each set is distributed, and to ascertain the exact portions of the pulmonary substance involved in the pneumonic inflammation. The true respiratory portion of the lungs consists of a series of air sacs situated at the extremity of each bronchial tube. These air-sacs are separated from each other by thin membranous walls. The pulmonary arteries are the only bloodvessels distributed to the air-sacs. These vessels ramify in the walls of the sacs, and form in them the pulmonary plexus. They are engaged not simply in carrying blood for the special function of the lungs, but also for the nourishment of the tissue to which they are distributed. Although the bronchial arteries pass along the bronchial tubes and supply the structures of those tubes and the areolar tissue of the lungs, they send no branches to the walls of the air-sacs, which are solely occupied by the plexus formed by the pulmonary artery. In speaking of the areolar tissue of the lungs, the author wished it to be distinctly understood that no such tissue is found in the walls of the air-sacs; it is only demonstrable in the adult lung around the bronchial tubes, the larger bloodvessels, and the lobules, as well as beneath the pleura. Such being the distribution of the bloodvessels of the lungs, and the arrangement of the areolar tissue, the next point for consideration is the exact seat of the pneumonic inflammation. On examining, under the dissecting microscope, a piece of inflamed lung which has reached the stage of hepatization, it is at once seen that the seat of the exudation is the air-sacs. These cavities are filled with solid matter: and, if the preparation has been kept in spirit for some time, moulds of the cavities can be drawn out. As the air-sacs are the seat of the exudation, it is obvious that the exudation must be poured out from their walls. The structures composing these walls must, therefore, be the seat of the inflammatory process; and as they contain no other vessels than those derived from the pulmonary artery, it is the branches of this vessel alone which are involved in the disease. In a piece of hepatized lung, exudation is sometimes found in the smaller bronchial tubes; at other times it is absent from them, and merely fills the air-sacs. Its presence in the bronchial tubes by no means proves that it has been poured out from their lining membrane; for it may have passed into the tubes from the air-sacs, being pressed out from the latter as they have become over-distended. In some cases of pneumonia there is no reddening of the mucous membrane of the finest bronchial tubes—no post-mortem appearances to show that there has been anything more than a simple uncomplicated pneumonia; whilst, in other cases, an increased vascularity of the bronchial membrane indicates the concurrent existence of bronchitic inflammation. Some pathologists, in speaking of the morbid anatomy of pneumonia, have described the exudation as taking place, in part, into the interstitial tissue. They have not, however, described accurately what they mean by interstitial tissue; and it is very important that clear notions should exist with reference to this particular point. The author has already mentioned that the lungs are not permeated throughout with areolar tissue, and that it only exists in certain parts, and in small quantities. The true lung-tissue—that which has been known as the parenchyma of the lung—consists of the walls of the air-sacs. These walls are firm and strong, but very thin. They consist of yellow elastic tissue, and a basement membrane, inclosing the pulmonary plexus. No areolar tissue is found in these walls; a fact which the morbid condition produced by pulmonary emphysema fully demonstrates. Although in pneumonia the walls of the air-sacs become somewhat thickened, this is due, the author believes, chiefly to the enlargement of the capillaries which they contain, and only partly to their retaining some of the exudation. Grisolle thinks that in pneumonia the capillaries are very probably augmented in number. It is impossible to decide positively with reference to this point, but the author's opinion is decidedly opposed to that of Grisolle. He believes that no development of new vessels takes place; they increase in size, but not in number. In gray hepatization, the air-sacs are still the seat of the exudation, and no destruction of their walls takes place unless an abscess is formed. There is no interstitial suppuration; the exudation-matters, in the process of cure, are either reabsorbed or expectorated. The following conclusions are drawn from the foregoing facts: 1. That pneumonia consists of an inflammation of the walls of the air-sacs of the lung. 2. That the bloodvessels involved in pneumonia are the branches of the pulmonary artery, which constitute the pulmonary plexus; and that the capillaries of the bronchial arteries are in nowise implicated, unless there be a concurrent bronchitis, which is an addition to the pneumonia, and not an essential part of it. To pass to the second subject of the paper—the early physical signs of pneumonia. The author believes that engorgement is not the first morbid change that takes place in pneumonia, and agrees with Dr. Stokes that there is a prior stage, characterized by a dryness of the pulmonary membrane, and probably intense arterial injection. In proof of the probability of this condition, an appeal is made to the facts furnished by auscultation—viz., the existence of a dry, harsh, loud, respiratory murmur preceding the crepitating rale. Two cases have lately been under the author's care in which the existence of a loud respiratory murmur was noted as an initial physical sign of pneumonia. In both cases there was acute primary pneumonia coming on in lungs previously healthy."

Dr. C. J. B. Williams said that some thirty years ago he had worked a good deal on the subject connected with the paper, and he was glad that the author confirmed the principal point with regard to the essential seat of pneumonia which he had propounded so long since. This was, that the inflammation essentially occupies the great pulmonary plexus of vessels; and that its occupation of these vessels, through which all the blood of the body has to pass, gives to pneumonia much of its grave character. In fact, from this circumstance pneumonia becomes much more than a local affection—it partakes of the characters of a blood disease; and its symptoms are more constitutional than those of any other local inflammation. Thus in sthenic the whole body is intensely heated; in typhoid pneumonia the several symptoms are those of typhus or blood-poisoning; in suppurative pneumonia they are those of pyæmia. The important bearing of this on treatment is obvious. He would further remark that other pulmonary diseases besides pneumonia, especially affecting the great pulmonary plexus of vessels, also manifested their effects on the blood of the whole body. Thus in general emphysema of the lungs, which wastes and reduces many of the pulmonary vessels, the system becomes anæmic and cachectic; and in extensive pulmonary tuberculosis the degenerative or scrofulous tendency rapidly pervades the body. So far, then, as Dr. Waters referred the primary seat of pneumonia to the pulmonic capillaries, he (Dr. Williams) agreed with him. But when he went on to exclude the extreme bronchial and other tissues from a share in the lesion, and to deny the very existence of any intervesicular or filamentous tissue, he (Dr. Williams) would wait for a further confirmation before he could accept his view. He had himself ascribed the peculiar rusty, viscid expectoration of pneumonia to an extension of the inflammation to the mucous membrane of the minutest bronchi, and had attributed the fine crepitant rhonchus to the forcible passage of air through this viscid mucus into the cells; and he still doubted that a better explanation could be given. There was something quite characteristic in this sign, consisting of a series of fine, sharp crepitations accompanying inspiration, which seem to be close under the ear, and limited to the spot of vesicular tissue which is their seat; and not, as in the case of bronchial rhonchi, heard in adjoining parts. Its ephemeral duration, too, was significant of the tendency of the inflammation to go on to more complete obstruction and consolidation, which superseded the crepitation by other signs. No doubt, if Dr. Waters's observations were exact, the pathology of pneumonia would be much simplified; but he (Dr. Williams) doubted whether they were compatible with the occurrence of certain varieties of pneumonia which had been described by himself and others, and which seemed to point out a variation in the extent of the inflammation, involving other tissues beyond the mere pulmonary plexus. Neither could he (Dr. Williams) agree with Dr. Waters in the importance which he attached, or the explanation which he gave, to the partial loud respiratory sound which sometimes precedes the crepitant rhonchus. In many cases it is never heard, for the breath sound is weaker than usual before the crepitus begins. In other cases, an irregular, exaggerated sound is sometimes heard; but it appeared to him to be a supplementary movement in the parts around the spreading obstruction, rather than to be due to dryness of the vesicles, as supposed by Dr. Waters. And here he (Dr. Williams) would take occasion to remark, that it is a mistake to suppose that inflammation causes dryness at any stage in serous membranes, or in parenchymata. In mucous membranes there certainly is dryness at any stage, from the interstitial congestion and effusion interfering with the natural mucous secretion; but in serous membranes it was otherwise—increased exudation attends every stage of inflammation. Some authors had erroneously ascribed the friction sound of pleurisy and pericarditis to dryness of the membrane; but he (Dr. Williams) had ascertained by experiments on animals that the friction sound is always due to a disposition of coagulable lymph, sometimes extremely thin; and this, by its adhesiveness, is the cause of the rubbing sound between the serous surfaces Neither is there any reason for assuming the existence of dryness, in the early stage of inflammation, of the pulmonary vesicles. which are as simple as serous membranes. In conclusion, Dr. Williams thought they were indebted to Dr. Waters for his researches; but he did not consider them conclusive on this subject, interesting alike to pathology and diagnosis.—*Med. Times and Gaz.*, Dec. 23, 1865.

12. *Certain Forms of Hæmoptysis, unassociated with Pulmonary Tuberculosis.*—Dr. Richard Payne Cotton draws attention (*Lancet*, Dec. 2, 1866) to what he believes to be a not unfrequent, though little recognized form of non-tubercular hæmoptysis, met with chiefly in the female sex, but sometimes among males, generally in the early period of life. He relates three cases illustrative of this, one of which is the following:—

"A young lady, aged 18, recently arrived from a residence in one of the West India Islands, was supposed to be phthisical. I was requested to see her, and report upon the nature of her disease, about which several very conflicting opinions had already been given. She was anæmic, nervous, and out of health; had a dry cough, but had not become thinner; her catamenia were regular, but scanty; her appetite was capricious; and she had had frequent hæmoptysis, which, there was every reason to believe, did not proceed from either the mouth or fauces. The blood, upon examination, was found to be thin and watery, of a dark colour, free from coagulum, unassociated with either bronchial or salivary secretion, and in general appearance much resembling a mixture of *red-currant jelly and water*. I was informed that this was its general character. Sometimes it had been considerable—as much as half a pint in twenty-four hours; at others, it would not exceed a teaspoonful or two during the same period; sometimes it would be scarcely enough to tinge a pocket-handkerchief, and often it would disappear for days together. This state of things had existed for nearly two years, causing great anxiety to the patient and her friends, from a belief that it was indicative of pulmonary disease. Careful examination of the chest, however, failed to elicit any evidence that such was the case. Rest, change of air, and the tincture of sesquichloride of iron, entirely restored this patient to health. It is now more than three years since I was consulted, and I heard a short time back that the young lady was in perfect health."

"Other cases of this form of hæmoptysis," he states, "have fallen under my observation; but I shall not specially refer to them in consequence of not knowing their sequel. At least twelve or thirteen have happened in my own wards at the Hospital for Consumption. Two only of these were males; the rest were females, generally of delicate and nervous appearance, and under the age of thirty. Several had very suspicious symptoms of phthisis; but the physical signs failed to exhibit any evidence of pulmonary tuberculosis, and most of them improved in health under appropriate treatment. In every case the expectoration was of the same general character; sometimes it was mixed more or less with bronchial mucus, slightly tinged perhaps with blood, and sometimes with salivary secretion; but more frequently it was simply watery blood, resembling, as I have described, a mixture of red-currant jelly with water."

The following are Dr. C.'s conclusions, drawn from his observations of such cases:—

"1st. There is a form of true hæmoptysis in which the expectoration is of a dark colour, and of a more or less watery consistence, bearing a close resemblance to a mixture of red-currant jelly and water.

"2d. That such hæmoptysis is of non-tubercular origin, and may proceed from any part of the gastro-pulmonary mucous membrane.

"3d. That it is attributable to a morbid and fluid condition of the blood, allied, at least in appearance, to that which is met with in purpura and scurvy."

13. *Snow's Theory of the Causes of Cholera Explained and Illustrated.*—The following able exposition of Dr. Snow's theory of the propagation of cholera, given in the *Med. Times and Gaz.*, Oct. 1865, by Dr. B. W. Richardson, will be read with interest.

"The first element of the theory is to the effect that cholera, pathologically, is a disease exclusively of the alimentary canal; that the great primary change from healthy to diseased action is at first locally confined to the alimentary tract;

that on this there is rapid exudation of fluid matter from all parts of the body; and that the collapse, cramps, coldness, and other external symptoms of the malady are but results of the abstraction of water from the tissues.

"The second element in the theory is that the primary change in the alimentary canal is always induced by the introduction into the canal of a specific poison.

"The third element is that the poison itself is exclusively contained in the intestinal excreta of the infected person—that is to say, either in the vomit or in the matters passed by the bowels. There is nothing exhaled from the lungs, nothing from the skin of the cholera patient, that produces the disorder. It is all a question of the increase of poison in the alimentary canal, and ejection of poison from the canal.

"The fourth element in the theory is, that the poison is not a gas, is not a vapour, but a substance capable only of existence either in the fluid or the dried form of matter; *ergo*, it can only be wafted a little way by the air, and when it is in the dried state it can only be carried long distances by being attached to articles of clothing, or by being disseminated through the agency of water.

"These are the essentials of Snow's theory. They have been misunderstood because they have not been separated from certain broad and practical conclusions with which he carefully connected them, and which have been much misrepresented.

"The leading misrepresentation of the Snow theory is that he, Snow, connected the spread of cholera purely with the supply of impure water; and we constantly hear the theory spoken of as though the author of it, having no grounds to go upon, had a bare crotchet that because people drank bad water they took cholera. This is an utterly false view of the case. Snow only looked upon water as the great means by which the cholera poison was distributed. He said, and he proved, that if choleraic excreta be supplied to a community by and through the water which that community drinks, such process will prove the most determinate means of introducing cholera into the community, and that by such process great and sudden outbreaks of cholera will be secured. Acting on this thought, he actually advanced directly to the cause of the cholera during the terrible Broad-street epidemic in London, and, removing the handle of the pump by which choleraic poison was being dispensed to many hundreds of the population, he stopped the plague as if by magic. But while he held to this view of water as a means of propagating the poison, he enforced the opinion that there were other modes of transit. He puts these modes into four groups. First, he held that the moist cholera excreta on the clothes and bedding of infected persons might be carried mechanically by the *vapour* of water, and might enter the nostrils and mouth in that form, and so be swallowed with the buccal secretion. It was in this way, he believed, that laundresses engaged in washing the clothes of infected persons were so readily attacked. Secondly, he maintained that the poison might dry on infected clothing, and that from such clothing, on its being unfolded or moved, the solid organic matter might escape in small substance, might be wafted a few feet in the air, and might, in fact, be absorbed through the mouth by any one exposed to it. Thirdly, in respect of nurses, persons who lay out the dead, and others in attendance, he urged that these might actually carry the poison on their hands, and infect themselves by taking their food while their skin was not properly clean. In mines and other dark places where many persons congregate, this, he thought, was a very common means of communication. Lastly, he concluded that the very utensils—such as basins and cups used by the sick—might convey the choleraic matter, or even the cloths on which such utensils, imperfectly washed, have been dried.

"Thus there was not a process by which the matter of cholera could be conveyed, omitted by Snow in his thesis; and we venture to state that if all his precautions were carried out, cholera would soon be an extinct disease.

"Another cause of misapprehension of Snow's theory deserves notice and explanation. It was unfortunate that the author of the theory died while yet the question to which we have next to refer was under consideration. The question was, whether there exists a specific cholera cell capable of reproduction, and from the first of which all other cells proceed; or whether there can be such a thing as a spontaneous generation of choleraic poison. It must be admitted that Snow, who was a staunch opponent of the doctrine of spontaneous generation, held by the cell theory, and was at first content to deal with the difficulties it suggested by comparing the origin of cholera poison with the origin of organic forms. Thus when he was once asked at the Medical Society of London where the first cholera cell came from, he answered by begging the questioner to tell him where the first tiger or the first upas tree came from; adding, 'I have no power to answer questions on the subject of ultimate facts.' Later, however, in his life he was beginning to reconsider the question of the origin of the poisons both of cholera and of typhoid fever; and had he lived, we doubt not that, guided by his clear and vast intellect, and his unbiassed nature, he would have modified his views in accordance with the natural truths that might have been presented to him.

"Is there any reason why at this stage of our knowledge we should ourselves modify that part of the Snow theory which treats of cholera poison as a reproductive cell capable of development only by reproduction? We think there is, and we believe that, in fact, such modification widens and strengthens the basis of the theory. The position seems to be this, that all the points Snow originally taught—in reference to the alimentary canal being the seat of the disease, and the alimentary excreta the poison of the disease, as well as in reference to modes of transmission of the poison—are confirmed; but that, in addition, such poison may, under peculiar conditions, be produced without the intervention of a first case. It is not, however, probable, nor, as far as we can see, possible, for such generation of poison to commence in the living body itself. The evidence seems to point to changes occurring in excreta that have been passed from the body. These excreta, during a process of special decomposition, become transformed into poisonous matter, which by its presence tends to excite the same change, in continuation in similar matter, and which, introduced, by accident, into the alimentary system of the living body, excites a new organic secretion and reproduction of poison.

"That there are periods when organic matters in a state of decomposition undergo peculiar transformations, or, in other words, that the process of decomposition is not a uniform process, always accompanied by the same products, is now generally accepted by the physiological world as a truth the importance of which cannot be over-estimated. We shall hope, indeed, one day to show, on experimental demonstration, not only that organic matters yield particular products under particular conditions, but that those products are also particular causes of disease; and we believe that so far, and in accordance with this demonstration, the theory of Snow will have to be modified. We shall then, while retaining the essentials of his theory, accept them *minus* the dogma that there must be, it matters not how remotely, some connection between one case and another case. We shall say that a case being in a community will communicate the disease if it be permitted so to communicate, and that, too, whether the case be an importation or a development; but we shall not say that necessarily the first case was an importation.

"In so far as practice is concerned, the whole experience of the present epidemic has been to show that choleraic poison, once developed, travels only in the manner suggested by Snow, and that all rational measures for suppression of cholera rest on a correct appreciation of his theory. Thus, at Constantinople, infected articles of clothing were washed in water which afterwards escaped to a drinking fountain; thus, in Paris, the disease is spreading by the aggregation of diseased with healthy persons; thus now, as in all former epidemics, it runs that those who attend most closely to the sick and wash the infected clothing die most speedily; thus it is that when the poison is introduced into or developed in towns where it cannot contaminate great supplies of water, the disease is localized and limited.

"The most striking illustration of the truth of Snow's theory has been given us at Epping in the outbreak which we described last week. There eleven persons were attacked and eight died. There the centre of the disease was on elevated ground; so that a low position had nothing to do with it. There the disease occurred with a falling in the mean temperature, so that heat had nothing to do with it. There the disease struck and destroyed before the sufferers had time to feel dread; so that fear was not the cause. There eleven people were attacked, while hundreds in the district and some in the house escaped; so that no pervading atmospheric influence especially affecting *individuals* had anything to do with the disease. There there was plenty to eat and plenty to drink; so that poverty had nothing to do with the matter. There there were persons young and old, and of different occupations and sexes; so that age, sex, and habit had nothing to do with the event. And yet eleven persons were attacked. To what central and single source can we look for causation? It is before us. The sufferers drank from an infected well, or they came in contact with excreted matter from infected persons. It matters little whether Mr. or Mrs. Groombridge in their travels did or did not accidentally come in contact with excreted cholera poison, and did or did not communicate to the drinking-water of their house such poison: or whether that water, impregnated with organic matter derived from the closet of the house, became poisonous, under a special form of organic decomposition: the results are the same, and while we deplore the catastrophe at Epping, we cannot but express satisfaction that the outbreak occurred in a place from whence the choleraic virus could only be distributed amongst a limited number of the unfortunate."

14. *Efficacy of Lemon-Juice in Diphtheria.*—Lemon-juice has for some time been recommended in the treatment of diphtheria. M. Guersant was in the habit of prescribing to his patients slices of lemon to be kept in the mouth and frequently renewed; but this was only an auxiliary measure, being used together with cauterizations and astringent injections. But in a paper presented to the Academy of Medicine last June, Dr. Révillout contends that lemon-juice is one of the most efficacious medicines which can be applied to diphtheria, and he relates that when he was a dresser, his own life was saved by its timely application. He employed three dozen lemons and gargled his throat with the juice, swallowing a little at the same time, in order to act on the more deep-seated parts. The results were that the false membranes were detached, the glandular enlargement decreased, and recovery soon followed. M. Révillout has noted eleven cases of entire success attained by this method of treatment. In one of his cases, which may probably be regarded as a type of the others, he prescribed as a gargle the juice of four lemons every hour, and the patient was directed to swallow a portion so as to modify the condition of the pharynx and œsophagus. The effects were to detach the diphtheritic exudations and to reduce the glandular enlargements, and the swelling of the face; and in twenty-four hours after the commencement of the treatment all appearance of diphtheria was removed.—*B. and F. Med.-Chir. Rev.*, Jan. 1866, from *Journal de Médecine et de Chirurgie Pratiques*, June, 1865.

15. *Hyposulphite of Soda in Diphtheria.*—Mr. J. C. Maynard extols (*Med. Times and Gaz.*, Dec. 30, 1865) the curative powers of the hyposulphite of soda in diphtheria. He ascribes the credit of this discovery to Dr. Tubbs, of Upwell.

The plan of treatment he describes as follows: "On first visiting a case, if not very far advanced, and in which only a few spots are visible, the throat is dressed twice a day with a strong solution of the hyposulphite of soda—viz., ʒiij of the hyposulphite; glycerine ʒij, with ʒvj of water. This generally removes the incipient exudation in forty-eight hours, sometimes in less. But if the case is an advanced one and the parasitic plant is making rapid strides, we wash the throat well out with warm water by means of one of Maw's flexible syringes. This is alike agreeable and most beneficial to the patient. The affected parts are then dressed with the strong solution, and a gargle of ʒss of the hyposulphite to half a pint of water, with ℥ss of glycerine, is given to be used every hour.

"The effect of the solution upon the exudation is most marked. It appears to solidify and dry up the false membrane, and when the syringe is again used, which is to be frequently done, the force of water will, if not completely, nearly entirely wash it away. The exudation in this way seldom or ever re-forms, and the patient makes comparatively a rapid recovery. In cases of a graver character, and where there is a larger collection than usual of inspissated mucus, we clear out the posterior nares by means of a powerful curved leaden syringe which is introduced into the nostril. In the putrid stage, and when the unpleasant odour from the throat is very offensive, a small quantity of Condy's disinfecting fluid added to the water with which we syringe the parts has proved of great advantage. I may add that from half a gallon to a gallon of warm water ought, certainly in bad cases, to be thrown into the throat three or four times a day. The ext. belladonnæ applied externally has proved very useful where there has been much swelling.

"In cases of very young children where it is difficult to dress and get at the throat, we give the hyposulphite internally, from gr. j to gr. iij, every four hours, and allow them to swallow the gargle, which, by the way, they very frequently do without permission. Dr. Tubbs informs me he is now giving to adults gr. viij, every four hours. Port wine, beef-tea, brandy, and bark are, of course, given in suitable quantities, and in cases where there was much prostration we have occasionally thrown up, with very satisfactory results, an enema of port wine, beef-tea, and isinglass."

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16. *Treatment of Articular Rheumatism and other Affections by the Subcutaneous Injection of Sulphate of Quinia.*—M. Dodenil has instituted some researches on this subject, and draws from them the following conclusions : 1. In articular rheumatism, as well as in other diseases in which its efficacy is established, the sulphate of quinia may be administered by the hypodermic method without serious inconvenience, and with some advantages that may be readily appreciated. 2. Those who have hitherto employed this drug in subcutaneous injection appear to M. Dodenil to have employed insufficient doses, which circumstance explains the absence of physiological phenomena in some of the published details. 3. It is necessary to introduce beneath the skin a dose above the half, and nearly equal to two-thirds of that which is given by the mouth, in order to obtain almost identical effects. 4. Absorption is more rapid, and elimination is more prolonged where a large dose is employed; and 5. The greatest advantages of the hypodermic method so applied are the rapidity and certainty of its action, and the immunity secured for the digestive canal. This last result is important, for the healthy condition of the stomach allows the patients to take food early, and shortens the period of convalescence.—*British and For. Med.-Chir. Rev.*, Jan. 1866, from *Bull. Gén. de Thérap.*, Aug. 15, 1865

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17. *The Hot Mustard Hip-bath in Diarrhœa and Choleraic Diarrhœa.*—Dr. Joseph Bullar extols (*Brit. Med. Journ.*, Nov. 18, 1865) the efficacy of the hot mustard hip-bath in diarrhœa and choleraic diarrhœa, and relates three cases illustrative of its curative effects.

"In these cases," he states, "no medicines were given. They are fair, simple experiments, in which there can be no possible doubt that the hot water mustard hip-bath relieved simple diarrhœa in a strong vigorous man and in a puny infant, and choleraic diarrhœa in a weak strumous child. I bring them forward as simple experiments worthy of attention; not as proofs that this should be the universal treatment of diarrhœa, but that it is one promising mode of treatment, simple, efficacious, rational, and now especially valuable as strengthening the more important point, that there is a stage in Asiatic cholera—that stage in which the great gush of watery fluid from the gastro-intestinal surface has taken place, followed by the cold skin, the shrunken hands, the want of secretion of urine, the commencing decarbonization of the blood—in which this powerful remedy may, by producing reaction, bring back the circulation to the surface, and stop the progress of the disease.

"That it is a most powerful remedy, these cases of diarrhœa prove; and the reasons seem to me to be these. In the first place, it produces a revulsion of blood to the surface, and thus changes that tide which has set in towards the organs of the abdomen.

"The visible effect of hot water at 110° with mustard is to redden the skin more, and with greater rapidity and permanence, than water alone.

"This red colour arises from the coloured blood-corpuscles becoming redder, more oxygenized, and therefore of higher vitality, than they do in passing through the lungs.

"Here, in the skin, the blood-corpuscles are passing from the smallest arteries to the radicles of the veins through the intervening capillaries, and would normally have become more purple instead of scarlet, having expended part of their oxygen. In cholera they have become at this point much more venous, giving the characteristic blue, or rather leaden aspect. The corpuscles are highly carbonized instead of oxygenized, and the patient dies of carbonized blood.

"In the last stage of life, his whole surface is leaden or blue and cold, and he lies pulseless often for hours; and, though so icy cold to the touch, throws off his bed-clothes, instinctively seeking through the skin more oxygen for the carbonized blood stagnating in his capillaries.

"Some years ago, a pastrycook here went into his ice-well, and was asphyxiated by carbonic acid gas there. Shortly afterwards, when his dead body was brought up, it was as blue and leaden and livid as a cholera corpse. He died of carbonized blood.

"It is true that respiration goes on to the last in cholera; but pathological anatomy shows that the mass of blood in the body is venous. The pouring out of the watery parts of the blood and its salts leaves the corpuscles without life, and in a short time incapable of being re-vitalized. The object and hope is, to stop this white hemorrhage before the red corpuscles are incapable of reoxygenation.

"Now, if we consider the large surface of the skin which is reddened by oath mustard bath and the rapidity of the circulation, the bath itself must, by this reddening process, be a powerful agent towards arterializing the whole mass of blood, and thus in giving more life. A blood-corpuscle does not take a minute to complete the whole circuit of the body. Each corpuscle thus reddened, and therefore more highly vitalized, passes on to the heart, and its place is instantly taken by another, subjected to the same process, and so on in every capillary vessel subjected to the heat and stimulus in an ever-flowing stream, and so rapidly that each makes the whole circuit (though it does not return to the same spot) in less than a minute of time. The amount of corpuscles so reddened in half an hour must be very considerable. I can only explain in this manner the rapid restoration to good health and strength in the cases related; and, if so, the hope that this treatment early employed may diminish the pernicious after-effects of the devitalized corpuscles in the vessels, only to be got rid of, if at all, by the after-fever.

"From this reasoning, it follows that the reddening stimulus to the skin must be over a large surface, and continued for a considerable length of time, and tried early, before the blood-corpuscles have altogether lost the power of becoming oxygenated. And the test that the remedy has been applied in time would be in its reddening effects on the surface. If no reddening were produced, the hot mustard-bath would have been applied too late."

18. *Atropia in the Treatment of Constipation.*—Dr. ALEXANDER FLEMING, in a paper read before the British Medical Association at its last meeting, extols the powers of atropia in the cure of constipation. He states that in the course of his practice, having had occasion to prescribe atropia, he noticed frequently that in a few days a slight relaxation of the bowels took place, and if constipation existed it was removed. Occasionally purging was produced. He thinks this effect is brought about by *increased* peristaltic action. The following is Dr. Fleming's explanation of the *modus operandi* of this article. The cause of this increased peristaltic action, he says, "may be direct stimulation of the muscular coats by the atropia carried to it with the blood; but other causes have been suggested to my mind from close observation of the effects of atropia on other parts of the body, more especially on the throat, stomach, and bladder. When this drug is exhibited in small and medicinal doses, it causes remarkable dryness of the throat and tongue, difficulty in, yet constant efforts at, swallowing. The changes in the act of micturition are

remarkable and noteworthy. This is often hurried and frequent, sometimes interrupted, and occasionally there is slight strangury. I have seen a patient compelled to make water every five minutes. In the throat, the mucous secretion is obviously checked, the membrane is seen to be dry, and the surface is thus rendered more susceptible of irritation; hence the constant efforts at deglutition. I believe the effect of the drug on other mucous membranes to be of the same nature; and, in the bladder, this arrest of the mucous secretion results in irregular and frequent micturition." According to this view, its action on the bowels is easily explained. The mucous secretion being checked, the irritation caused by the contents of the intestinal canal, when its surface is thus unprotected, provokes more prompt and vigorous contractile action.

Secondly, atropia constricts the smaller arteries; and we can understand that a gut, dormant and paralyzed by distension, is the subject of passive congestion, the continuance of which will contribute to maintain its state of inertia. Atropia, acting on the arteries, checks the supply of blood to the bowel, relieves the congested muscle, and thus facilitates its return to healthy action. This *modus operandi* is analogous to the well known effect of blood-letting or leeches, in relieving the congestion of, and unloading an inflamed intestine.

Accepting these views of the *mode of action* of atropia on the bowels, we at once perceive its advantage over the ordinary irritant purges in the treatment, not only of simple constipation, but especially of the more serious and alarming cases of intestinal obstruction from impacted feces. The ordinary irritant purges provoke increased secretion and peristaltic action of the gut *above* the obstruction; this may succeed in propelling the accumulation forward, but should it fail in doing so, we have inverted action and vomiting, with the further risks of enteritis and general, and it may be fatal, exhaustion of the patient. Atropia, on the contrary, operates through the blood on the entire canal; acts directly on that part of the gut which is distended by the accumulation, and so paralyzed. Deprived, by the drying qualities of the drug, of its natural coating of mucus, the mass more readily provokes irritation; the natural contractile action is re-established; and the bowel is more or less quickly relieved of its contents.

There is another circumstance connected with atropia, which distinguishes its operation from that of common purgatives; its action is not followed by reaction; its relaxing power is not succeeded by a disposition to constipation. On the contrary, the improved action of the bowels is, comparatively speaking, sustained.

The powder and extract of the crude drug belladonna have been employed successfully in constipation by Bretonneau, Trousseau, Fleury, Drs. Brinton, Routh, Fuller, Leared, and others; and a most interesting paper on the Use of Belladonna in Intestinal Obstruction was read at the Bristol meeting of our Association in 1863.

Dr. F. does not undervalue the importance of diet and regimen in constipation, but assigns to them the first place in the cure, and he regards medicines only as auxiliaries.

In cases of *simple* constipation, Dr. F., has exhibited "atropia in various forms, both in pill and in solution; but my later experience has led me to the adoption of a plan of treatment, of which the following is an outline.

The subjoined draught is given the first thing in the morning and the last thing at night on an empty stomach. ℞.—Magnesiæ sulphatis ʒj; acidi sulphurici aromat. ♏x; tinct. aurantii ʒj; aquæ ad ℥j. M. Ten minims (containing one-sixtieth of a grain) of a solution[1] of atropia are added to the draught at bedtime; and the dose is increased nightly by two minims, until a very slight degree of the earlier physiological effects of the drug—dry throat, wide pupil, and dim sight—is produced. This is attained with much precision and safety; but it may be necessary to give thirty, forty, or even fifty minims, according to the strength of the patient, before this result is attained. The dose should then be somewhat diminished, and continued at the reduced quantity for two or three weeks, as circumstances may indicate. I then discontinue the drug gradually; and finally replace it with strychnia, giving five minims of a solution[1] in both morning and evening draughts for a week or two; or the strychnia may be given alone as soon as the saline draught can be dispensed with. This commonly suffices to restore the normal tone of the bowel, and completes the medicinal treatment.

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[1] The solution of atropia which I use is made thus: Atropia, 1 grain; distilled water, 5 drachms. Dissolve *thoroughly* with the aid of a few drops of diluted muriatic acid, and add of rectified spirit sufficient to make ten drachms. This solution keeps well, and is of uniform strength. The tincture and extract of belladonna, however carefully prepared, vary much in power. I have found the tincture of one chemist seven times the strength of the same preparation from another and equally respectable chemist; and the extract is even more uncertain. The internal, and at the same time efficient, use of these preparations is for this reason

When constipation is neglected, the feces accumulating gradually distend the bowel, and finally deprive the muscular coat of its irritability and contractility, and we have established one of the most frequent forms of *obstruction* of the bowels. (The observations in the present paper refer to this form only.)

If, after a moderate use of the ordinary purgatives by the mouth and in the form of enemata, the obstruction shows no disposition to yield, and the patient suffers from pain and distension of the belly, with (it may be) nausea and vomiting, I prohibit entirely the use of the more powerful cathartics, the exhibition of which increases the vomiting and irritation and may provoke inflammation. I desire the patient to be confined to liquid food; viz., milk and beef-tea alternately every four hours. If there be much vomiting, I direct the milk to be mixed with one-third of Carrara water, and the quantity of food at each meal to be very small, until the irritability of the stomach has subsided. The following draught is prescribed every four hours, one hour before each meal. ℞.—Magnesiæ sulphatis ʒj; solutionis atropiæ (author) ♏iv; acidi sulphurici diluti ♏x; aquæ, ad ℥j. M. Fiat haustus.

Should there be much spasmodic pain, I add half a drachm of chloric ether, prepared by distillation, to each dose. This draught is, for the most part, readily borne by the stomach; promotes gently the action of the bowels; and softens their contents. The atropia favours, in the manner already indicated, the contractile power of the gut. In using atropia in the manner specified, the patient *must* be seen twice daily; for, as a slight degree of the physiological action of the drug should be induced, the dose should be increased, diminished, or omitted, according to the effect observed. If pain and indications of approaching inflammation be present, warm fomentations to the belly are demanded; on the other hand, if these symptoms be absent, the general purpose of the medication is promoted by frictions two or three times a day with warm liniments; the rubbing to be so applied as to promote the normal course of the intestinal contents.

In a considerable proportion of cases, this treatment alone affords the desired relief; in other and more obstinate examples, we have to conjoin the use of aperient enemata. These should be used two or three times daily; and be introduced by means of the rectum-tube as high as possible into the bowel. When ordinary injections fail, ice-cold water sometimes succeeds; and it is well to bear this in mind.

Between the enemata, galvanism should be applied to the bowels. This agent should be conducted through the rectum, and passed, as nearly as may be possible, through the paralyzed gut; care being taken to employ it gently, but

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very unsafe. The solution is so proportioned, that ten minims, containing one-sixtieth of a grain of atropia, is the commencing dose for the adult.

[1] The solution of strychnia which I use is made thus: Strychnia, 2 grains; distilled water, 5 drachms. Dissolve the strychnia *thoroughly* with help of a little diluted muriatic acid, and add of rectified spirit sufficient to make ten drachms. This solution has the same advantages over the powder, extract, and tincture of nux vomica, that the solution of atropia has over the tincture and extract of belladonna. It is uniform in strength, passes readily into the circulation, and the dose can be apportioned with accuracy. The ordinary commencing daily dose is ten minims, and contains one-thirtieth of a grain of strychnia.

repeatedly, our object being rather to restore the action of the bowel by small but successive doses of the stimulus, instead of attempting to dislodge the impacted contents by one powerful application of the galvanic current.

Employed in this manner, the galvanism is infinitely more efficient than when passed in the ordinary mode from the back to the belly. It gives rise, however, to acute suffering; and, unless it be used gently, as I have directed, tends to exhaust the patient."—*British Med. Journal*, December 23, 1866.

[In the employment of so potent a remedy as atropia, we should be remiss in our duty did we not enjoin on the practitioner extreme caution, and that it should only be used where the attendant can see the patient at short intervals and keep close watch on its effects.]

19. *Curability of Bright's Disease.*—The *Lancet* (Dec. 16, 1865) contains a highly interesting and practically valuable paper on this subject by Dr. Arthur Hill Hassall. He gives the details of five cases, a *résumé* of the results of the treatment of which, so far as the albumen contained in the urine is concerned, is as follows:—

Case 1.—Francis S——. In this case the mean amount of albumen excreted, after his admission into the hospital on the 20th of October, 1864, was 70 grs. per day, but when he left at the end of January, it was reduced to 4.86 grs.

Case 2.—Edward G.——. The mean quantity of albumen in the urine at the period of his admission on October 29th, 1864, was 310 grs. per day, which was reduced on quitting the hospital, in the early part of January, to an average of 195 grs.; but at the end of July a still smaller quantity was found—namely, 161.4 grs., showing a total diminution of 148.6 grs.

Case 3.—Joseph J.——. This patient, shortly after his admission on April 19th, 1865, was passing 357 grs. of albumen per day, and on leaving the hospital of his own accord the amount still remained high, being 362 grs., notwithstanding which his condition had greatly improved; but at the end of July the mean quantity was only 202.9 grs., being a reduction of 154.1 grs.

Case 4.—John C——. The average daily amount of albumen passed after admission on January 12th, 1865, was 184.05 grs.; this was considerably decreased by the end of March, when he was discharged from the hospital, 124.4 grs. being then excreted. This quantity, however, was still further reduced when the urine was next examined, on Aug. 5, 77 grs. being found, showing a diminution of 107 grs.

Case 5.—Martin H——. In this case the patient, at the period of his admission on February 15th, was excreting 245 grs. of albumen daily; but on July 9th, just before he was sent to the Convalescent Institution, only 6.16 grs. were found for the day, the patient being in fact almost completely cured.

Dr. H. confesses that the striking facts recorded by him has excited his surprise. "The impression," he remarks, "I had derived from books in reference to Bright's disease was that it was nearly always a fatal and incurable affection, whereas it is really much more amenable to treatment than could have been anticipated—so much so, indeed, as in my belief to fully justify the title I have given to this communication. The particulars recorded appear also to prove that the disease is not exclusively local and organic, but is to a great extent a blood disease."

The treatment adopted in all the above cases, although varying in details, was similar in its principles. The free action of the skin was maintained by the occasional use of the vapour bath. Congestion of the kidneys, when present, was relieved by means of dry cupping. Tonics and astringents were administered, consisting chiefly of the tincture of the sesquichloride of iron, sulphate of quinia, tannic and gallic acids, and when the effusion was very great, occasional doses of hydragogue cathartics and diuretics were given; but above and before all, great attention was paid to the diet. This was rendered highly nitrogenous; milk and eggs were freely given, and meat two and even three times a day; indeed it is to the diet prescribed, and the rest from toil and anxiety experienced by the patients while remaining in the hospital, that I chiefly attribute the successful results of the treatment. The absence of wasting, notwithstanding the enormous loss of albumen, is remarkable in most cases of Bright's disease, and was especially noticed in the cases above recorded, the majority of the patients throughout their illness retaining a considerable degree of plumpness and flesh.

20. *Entozoa in the Muscles of Animals destroyed by Cattle Plague.*—Mr. Lionel S. Beale has been for some time engaged in researches upon certain, for the most part spindle-shaped bodies found in the tissues of animals which have died of the cattle plague, and he has published (*Med. Times and Gaz.*, Jan. 20, 1866) the results with figures of the supposed entozoa.

The facts concerning these entozoa he sums up as follows:—

"1. That in almost all, if not in all, animals dying of cattle plague, entozoa or entozoon-like bodies exist in considerable number in the voluntary muscles of the system and in the heart.

"2. These or closely allied species have been known for more than twenty years, but their nature has not yet been determined. They have been found in the ox, sheep, deer, pig, rat, mouse, and perhaps other animals.

"3. They are occasionally found, but in very small numbers, in animals apparently in perfect health when killed.

"4. In the muscles of a calf killed by cattle plague, under *six months* of age, these bodies were found in immense numbers.

"5. They vary in length from less than the $\frac{1}{300}$th of an inch to at least a quarter of an inch in length. They are, for the most part, imbedded in the contractile material of the elementary muscular fibre, but they are occasionally found free.

"6. They are for the most part spindle-shaped, and the external investment or envelope exhibits a very delicate and peculiar structure, being completely covered with delicate hair-like processes.

"7. The mass within appears granular to low powers, and exhibits a division into numerous segments, but it is found to consist entirely of minute bodies resembling one another, possessing very definite characters, less than the $\frac{1}{2000}$th of an inch in their longest diameter, and of peculiar form, being oval, flattened, the body slightly curved laterally, with one extremity blunt and the other almost pointed.

"8. The entire mass increases in size as these small bodies increase in number, probably by division and subdivision, within the cyst."

Dr. Cobbold calls in question the entozoal nature of these bodies, and expresses his belief that they are "sacs of psorospermiæ, and, therefore, also entophyta rather than entozoa," and that "their granular contents when highly magnified resemble the non-ciliated zoospores of certain confervoid algæ."

"The scientific question," remarks the editor of the *Med. Times and Gazette*, "as to their proper classification and nomenclature is of course very interesting, and a very desirable one to determine; but when this is done, the further question still remains for solution, what is their precise signification, and what is the meaning of their presence in the flesh of the diseased oxen? We know that they are living germs, that they pervade the muscular tissue of the diseased animals, and in our present ignorance, not only of their exact meaning, but also of whence they are derived, and of what are their effects upon the living solids and fluids, it appears to us that they are likely to be just as pernicious to life, and just as likely to be the disease itself, in the case of their being of a vegetable as of an animal nature. As far as we know at present, these bodies are present in every case of cattle plague, and are absent from the flesh of healthy oxen, or if present at all are in such sparse quantity that a long search has to be made to find one. This alone is a very strong fact, and when a similar connection was found between the presence and absence of trichinæ in human muscle and somewhat similar symptoms, no difficulty was found in at once arriving at the conclusion that the presence of the trichinæ and the morbid train of symptoms called trichinosis were really cause and effect.

"If these parasitic bodies should prove to be vegetable rather than animal germs, we think the fact should not be forgotten that our late long and dry summer and autumn were most prolific in all the lower forms of vegetable life, and that on the first outbreak of the cattle plague the question was seriously mooted whether it might not in some way be due to the *uredo rubigo*, or red rust which infected some sorts of grass to a remarkable extent. In one of the earliest occurrences on a large scale in England of this pestilence, both amongst oxen and sheep, the grass upon which they had fed was observed to be most remarkably affected with this blight, and at that very time we directed our attention to the possibility of a connection between it and the disease, and particularly with reference to the inhalation of the spores into the lungs; but although these bodies could be readily enough traced in the mucus of the air-passages of the dead animals, nothing further confirmatory of such an idea could be elicited."

21. *Outbreak of Trichinosis at Hedersleben.*—A most formidable outbreak of trichinosis has lately occurred at Hedersleben, a village of 2000 inhabitants. Dr. Kratz, in a preliminary report upon the outbreak, states that commencing at the end of October it still remained formidable at the time of his writing, December 10. It differed in several respects from other epidemics that have been recorded. Its most constant symptom at first has been the occurrence of vomiting and choleriform diarrhœa, accompanied by peculiar pains of the flexors of the extremities. Excessive sweating, sleeplessness, small and quick pulse, and great abdominal pain were other symptoms. The diarrhœa sometimes ceased spontaneously, and between the third and fifth week great oppression of respiration set in, marked by paroxysms of intense dyspnœa, occurring chiefly at night; and when autopsies have been made in these cases abundant migration of the trichinæ into the respiratory muscles, and especially the diaphragm, was discovered. Frequently in the course of the affection there was so considerable a subsidence of the symptoms that a very favourable prognosis seemed admissible; but in many of these cases a sudden aggravation of symptoms occurred, which soon led to a fatal termination. The period of the outbreak of the disease, after eating the infected flesh, was very varied, so that the period of incubation might be said to range from two days to four weeks; individual susceptibility seeming, however, to have little to do with this, the amount of the meat eaten chiefly determining the rapidity of the supervention of the symptoms. The favourable condition of childhood is remarkable, for of more than 100 children affected none have died. This may be due to the more active condition of the alimentary canal at that age; an observation corroborated by the unfavourable results which occurred in the early cases treated by opium. Of about 350 cases from 80 to 90 had died at the date of the report, about 200 of these persons having eaten the flesh completely raw.

Dr. Kratz gave benzine a very complete trial, but it is very doubtful whether it proved of any utility, for it seemed to exert no effect upon the migration of the trichinæ, while these animals could be kept alive in it for several hours. Continued in large doses for some days, Dr. Rupprecht believes that it may favour the occurrence of the muscular exhaustion which is to be dreaded in the disease.

Dr. Kratz, however, reserves his final decision as to its effects.—*Med. Times and Gaz.*, Jan. 20, 1866.

22. *Diagnosis by Means of the Ophthalmoscope.*—M. Bouchut, of the Children's Hospital, tells us that since 1862 he has paid great attention to the diagnosis, by means of the ophthalmoscope, of cerebral hemorrhage, softening of the brain, hydrocephalus, compression, and other diseases of the brain. His observations, now sixty in number, prove that all diseases which interfere with the cerebral circulation impede more or less the venous circulation of the eye, rendering the veins of the retina more distinct, dilated, and varicose; sometimes rupturing them, filling them with clots, and causing serous infiltration and hemorrhage in the retina, and consequent atrophy, etc.—all of which lesions are appreciable by the aid of the microscope.—*Brit. Med. Journal*, Dec. 23, 1865.

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

23. *Use of Chloride of Zinc in Surgical Operations for Removal of Cancerous Tumours.*—C. DE MORGAN, Esq., Surgeon to the Middlesex Hospital, has published (*British and For. Med.-Chirurg. Rev.*, Jan. 1866) an extremely interesting paper on this subject. "The use of the chloride of zinc," he states, "was adopted in the first instance after removal of malignant tumours by the knife, for reasons which apply exclusively to operations on such growths. The results which were obtained led me to resort to its application in all wounds, whether made in operations or accidentally. Whether the special object for which it was at first used is attained even partially can only be proved by very long experience, but the general effects have been so immediately and uniformly beneficial in a large number of cases in which it has been applied, as to satisfy me that in the treatment of wounds the chloride of zinc is an agent of great value, well worthy of careful trial by surgeons."

Mr. De Morgan expresses his conviction "that in most cases of recurrence [of cancer], where the tumour has even been to all appearance entirely removed, the recurrence has been due to the presence of minute cancer elements which have escaped the knife, or, as is perhaps as frequently the case, to germs being set free by section of the tumour or of diseased tissue around it during the operation, and their implantation into the newly-cut structures. That this is the case is, I think, shown by the fact that where a voluminous breast with only a small tumour imbedded in it is removed, and the incision is consequently very long in proportion to the size of the tumour, the recurrence frequently takes place along the whole line of cicatrix, not especially in that part which corresponds to the site of the tumour. If, then, the view which has been so ably advocated by Mr. Moore be correct, that cancer is a local disease which becomes disseminated from the point of its first invasion, the practice of early extirpation cannot be too much insisted on. A tumour, as soon as it is recognized as cancerous, should be removed, if practicable, at once. A few days, even, may make a difference; not, perhaps, to any extent in the size of the tumour, but in the extension of its germs beyond its apparent limits. It would be better even to extirpate doubtful tumours, some of which might turn out on after examination not to be cancerous, than to leave them to develop themselves, and then to find, too late, perhaps, for help, the characters of malignancy becoming marked. These views, which had often been discussed amongst the members of the surgical staff at the Middlesex, encouraged Mr. Moore, in a severe case of breast cancer, to apply the solid chloride of zinc to a large portion of the surface of the wound made in its extirpation, as he had effectually done in a case of extensive epithelioma of the face, which he showed at one of the meetings of the British Medical Association in London. This was done in April, 1864."

It occurred to Mr. De Morgan that "one might obtain the benefits which were sought by using the caustic in a less active form, and that a strong lotion of the chloride of zinc applied freely over the whole exposed surface, after an operation for the removal of cancer, would penetrate to some little extent beyond the limits of the section, and would at least destroy any floating particles of the disease which might adhere to it without endangering the vitality of the whole thickness of the flap.

"The first case in which I tried this plan was that of a lady, forty-one years of age, who had a cancerous tumour in the right breast. She was well nourished and healthy, and had noticed the tumour about a twelvemonth. In the axilla was a gland slightly enlarged, but not hard, and in all respects the case was a favourable one for operation. The operation was performed in March, 1865. The strength of the solution employed was twenty grains of the chloride of zinc to the ounce of water; the whole surface of the wound was well sponged with it. The blood which still oozed was, as usual, rendered of a bright pink colour, and the contact of the solution at once caused a more free oozing from the exposed surfaces; otherwise no effect was perceptible. The lotion was thoroughly pressed in with the sponge, and in a little time the surface became soft and creamy in feel, and this softness extended to a little depth—a line, perhaps. Here I stopped, not knowing how far I might venture without causing sloughing of the flaps of skin. My impression was that a superficial slough would form, and would be thrown off by degrees during the suppurating stage, which, I assumed, must of necessity ensue, and which, in fact, I rather desired. The edges of the wound were, nevertheless, put together with sutures, save at the outer part, which was left quite open, to allow of the free passage of the supposed inevitable pus. A compress was put over the wound to check the tendency to any further bleeding into the cavity. After recovering from the effects of the chloroform, she complained for two or three hours of smarting pain; not more, I think, than is usually felt, and from that time she was entirely free from any pain at all. I thought it probable that on removing the compress, about eighteen hours after, the parts would be found swollen and angry, although the pain had been so slight; but instead of that, the circumstance most noticeable was the absence of even the usual amount of fulness. It was evident that action, instead of being increased, had been diminished, one might almost say arrested, by the application. The skin, even up to the cut edge, looked and felt exactly like the skin of the other breast. Blood, in much about the same quantity as is usually found after such an operation, had oozed from the wound; but it was pink and creamy in character, and what was especially remarkable was the entire absence of the peculiar odour which is generally found in blood which has been pent up beneath a compress for some hours. There was, in fact, no animal smell at all. But what most struck me in the progress of the case was the absence of suppuration. The whole line of incision united in the course of forty-eight hours, except just at the outer angle, which discharged a *very* small quantity of the same pink, creamy-looking fluid for a day or two more, and then healed. The same absence of animal odour was noticed to the end. I certainly never saw a wound which did not heal absolutely by the first intention go through its process of cure so speedily or so quietly. The patient remains perfectly well to the present time.

"In cases of cancer on which I have subsequently operated I have used stronger lotions. In this first case the strength was 20 grains to the ounce. I next tried 30 grains, and then 40 to the ounce. With the stronger lotion a more rapid effect is produced, and the blood exudes more abundantly, but this is only for a few seconds, otherwise much the same course of events has been seen as in the first case during the early period. Some have healed in the same rapid manner, in some there has occurred an after suppuration, but in none have any bad effects been seen.

"What the effect of this treatment may be in limiting the tendency to return after extirpation of cancer, can only be determined by time and numbers. If the views of the diffusion and transplantation of cancer germs before expressed have any truth, it cannot but be beneficial; for to some extent it certainly must alter the character of the exuded matters and of the remaining tissues. My own impression is, that in cancer it would be well to go beyond the point hitherto reached, and that this may be safely done, for the effect of the chloride of zinc seems to be limited to the point with which it is brought into contact. It appears to produce very little irritation beyond that point, so that it may be worked into the inner surface of the flap till the tissue is softened to within a few lines of the surface without risk to the vitality of the remainder."

The favourable way in which the wound healed in the case just related satisfied Mr. De M. that the application might be employed in other than cancerous cases. "There was one point," he remarks, "which especially struck me, as giving it great value in hospital practice; the perfect purity of the discharges from the wound during the first few days after an operation. It is well known that the presence of decomposing animal matter tends to bring any dead animal matter with which it may be in contact into a rapid state of decomposition; and if this take place in a wound, it will certainly interfere for a time with the natural and healthy processes of cure, and may induce erysipelas or pyæmia.

"That this decomposition does usually occur is evinced by the peculiar sickly animal smell which is perceived whenever a wound which has been covered for a few hours is opened. When, on the contrary, a wound has been fairly impregnated with the chloride lotion, there is invariably an absence of any animal smell whatever for two or three days; and, unless some diseased tissue remain in the wound, there may be none throughout the healing. Were this the only advantage, it would be a great one; I believe that in our hospital it has saved many a patient from erysipelas; certainly we have been for the last eight months very free from it after operations, while just before it was very prevalent. But this may be an accidental coincidence merely, and time and experience can alone determine how much is due to the treatment. It is not, however, the only advantage. One of the most striking consequences of the application is the quiescence of the wound. The action which one would imagine must of necessity follow the application of an escharotic so powerful as the chloride of zinc, is never to be seen. The parts, up to the very edges of the wound, retain their natural colour during the early periods after an operation. I can state this confidently after the use of the lotion in varieties of operations, the removal of tumours, amputations, even with extensive and thin flaps, as Syme's and Mackenzie's amputation, operations about the rectum, involving the mucous membrane, and in the perinæum, and in many others, as well as after accidental wounds. In many cases the wounds have healed in twenty-four hours, without the least fulness or swelling, and leaving a line of cicatrix which after a short time could hardly be seen or felt."

"That great pain sometimes attends the immediate application to a sensitive wound need not be mentioned. But this is not lasting. In most cases it subsides in from one to two hours; in some cases it does not occur at all. Where the application is made after an operation done under chloroform, the patient generally remains altogether free from pain. This is particularly the case when morphia has been subcutaneously injected, as Mr. Moore first suggested, immediately the operation is concluded, and before the effects of the chloroform have passed off. After this proceeding the patient often remains calmly asleep for some hours, and wakes entirely free from pain. There seems to be also less tendency to sickness. When, however, the immediate pain of the application has once subsided, the comfort which the patient enjoys is very striking. I have seen cases in which the patients could not tell from their sensations after a couple of hours that any operation had been done. One can explain, perhaps, from observing the action of the chloride, why action and consequent pain should be lessened or altogether prevented. It is quite clear that the chloride of zinc does not act as an irritant beyond the point of contact. If its use is carried so far as to produce an eschar, the eschar will act as an irritating body, and there will be inflammation and swelling around it; but if applied short of this, and it requires a continued application of the solid chloride to make an eschar in the natural structures, it produces a peculiar pulpy state of tissue, widely different no doubt from the natural tissue; but certainly not eschar, not a charred mass which *must* be removed by the ordinary process of separation below and around it. Were the surface of a large wound converted into an eschar, it could not heal in twenty-four hours. And yet the tissue appears disintegrated; it is rapidly discharged as a creamy exudation, leaving the parts below perfectly natural in appearance. This can easily be seen when the lotion is applied to an open wound. In this creamy surface must be involved all the sensitive and vasculo-motor nerves, and their function must be arrested. With many escharotics, as the actual cautery, the acids, &c., the irritating effect is propagated along the nerves beyond the point of contact. Although the nerves exposed on the surface may be destroyed, the effect is carried beyond this point, increased nerve action and inflammation is the result. It is not so with the chloride of zinc. From whatever cause it may be, the action terminates at the point of contact. The sensitive surface is destroyed, but no irritation is set up beyond the part directly acted upon. Hence there is no pain, no vascular action, no inflammation. Whether this is or is not the true explanation, the fact certainly is as I have stated it.

"Of course I do not mean to assert that all this immunity will be found in every case; but I can safely say that I have never seen it otherwise, and that, as a rule. I have never seen the general run of cases go through so favourable a course as since I used this application.

"The mode of application has been described in connection with the first case in which I tried the solution. The first effect is always to stimulate the small vessels and cause a general oozing of blood from surfaces which had been previously dry. The blood becomes pink and creamy by contact with the chloride. On further application of the solution the whole surface is softened and assumes the same pink colour. The blood will continue to ooze out as long as the solution is applied, and for a short time after. Every part should be well saturated with the chloride—the edges of the skin, the adipose tissue, the spaces between the muscles, the medullary cavity, or cancellated structure of bone. At first I was afraid to touch bone with it, but I find now that no harm comes of doing so. The surgeon need not hesitate to apply it even to thin and delicate structures. Those cases have done best in which it has been most thoroughly used. For wounded surfaces I generally use a solution of from thirty to forty grains to the ounce of water."

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24. *Subcutaneous Ulceration.*—By Jas. Paget (extracted from a clinical lecture). Among the frequent effects of inflammation are, the separations of adjacent layers of different tissues. Some of these deserve special notice for their practical importance. The simplest examples of this dissevering process are those in which one finds the capsule of the kidney more than usually separable, or the periosteum too easily stripping from the bone. In these cases there may be no more morbid change than that of softening of the walls of vessels, and the small quantity of connective tissue, which naturally hold together the two parts. A greater change is effected when articular cartilage can be stripped from bone; for here the separation is not possible till after the ulceration or extreme softening of one or both of the adjacent layers. In some of these cases it is observable that the disseverance of the bone and cartilage is without apparent formation of pus, or other morbid fluid. The cartilage, usually ulcerated on its under surface, can be raised from contact with the ulcerated bone, or the thin layer of granulations covering the bone, and no pus visible to the naked eye lies between them. This manner of disseverance by ulceration of bone and cartilage is generally known; it is a common result of acute inflammation of the joints. A similar process sometimes separates the subcutaneous fat from the subjacent fascia. It may fairly be called subcutaneous ulceration, to distinguish it from that with which it is mostly confounded—namely, the diffuse suppuration of the subcutaneous fat. There are truly several points of resemblance between the two processes, as there are between all instances of suppuration and ulceration: but a manifest difference is in this—that in the one the suppurative, in the other the ulcerative, process is greatly preponderant. In the diffuse suppuration, the pus forms an evident collection of fluid more or less widely separating the layers and upraising the skin; but in the ulceration, the separated layers remain in contact, or with only a little fluid between them. With these differences, others equally marked coincide in the general condition of the patients, and in the course and necessary treatment of the local disease. In the girl now under treatment, the disease appeared, when she was admitted into the hospital on August 15 of last year, as an ill-defined patch of mottled, dusky redness, larger than one's hand, across the front of the lower part of the thigh. This patch of diseased integument was scarcely raised above the surrounding level. To the touch, it felt firm and brawny, but unequally so in different parts. It was hot, but not very painful, and at only one or two points tender upon pressure. Higher up in the outer part of the thigh were two scars, said to have been formed after similar disease there. The patient's general condition was that of mere debility, and that not extreme. She had no fever, no hectic, no rigors, and, except after a slight attack of pneumonia, she scarcely lost weight or strength. A variety of different modes of treatment were all equally useless for the remedy of this state. Complete rest, blisters, ointment of iodide of mercury, and the internal use of iron, iodide of potassium, cod-liver oil, had no sensible effect. At length, one of the places at which tenderness had been long observed was found soft as if

with pus. This was opened, and in a few days later the opening was found to lead to a large space, in which the subcutaneous fat was completely separated from the fascia. The skin over this space was not upraised by any collection of fluid, and when the space was freely laid open by incision scarcely any pus flowed from it.

Within the last two years you have had opportunities of seeing three other cases of this kind under my care, and from them you may have been able to gather a general description of this disease. All the cases, you may have observed, have been in young persons of pallid complexion, with very feeble health; thin, and with very little muscular power. They might be called strumous, although they have not all the distinctive features of struma. In all of them the disease has been near the knee, where it is certainly most frequently seated, and in all the subcutaneous tissue, after feeling for a time firm and brawny, as if with inflammatory infiltration, has softened in one or more parts, and then has been widely undermined by slowly extending ulceration, with very little formation of pus. In the patient now in the hospital the skin is much more evidently and widely diseased than in the others; in them much of it, even when undermined, has appeared nearly healthy, neither elevated, nor tense, nor reddened; but some part of it, after slowly softening and then ulcerating, or being punctured, has let way into the ulcerated subcutaneous space. In all, this space at the first laying open has yielded very little pus; in none has any slough or tuberculous matter appeared; but all the surfaces after exposure have suppurated freely, though thinly, till near their healing. In no instance has the skin itself ulcerated widely, however far the subcutaneous ulceration might extend. In all alike the only effective treatment has been such a thorough laying open of the ulcerated spaces, and of all bays and channels leading from them, as has completely exposed their surfaces, and permitted them to be dressed by packing. By this alone has the ulceration been either stayed or healed. Till this has been done the ulceration has always gone on extending subcutaneously, and its exposed surfaces have shown no signs of healing. Drainage tubes, setons, injections, compressions, and many other means have alike failed. In all the cases the ulcerated surfaces thus exposed have healed slowly, forming large thin tender scars, easily breaking down or ulcerating; but finally all have recovered. Moreover, none of these patients has had any acute constitutional disturbance, and none of the medicines given them—tonics, iodides of potassium or iron, cod-liver oil, or others of the same classes—has appeared to have any really or directly remedial influence. To those who were before in poverty the hospital diet has seemed to do little good till the local disease has been brought towards recovery by the incisions; and after nearly complete healing the complete and firm scarring has been delayed till change of air has given renovated health.—*Med. Times and Gaz.*, Jan. 27, 1866.

25. *Cancer of the Testis in Children.*—This, according to M. GUERSANT, is not very rare. Many authors have described cases; and he has met with at least a dozen in very young children, even at birth or at the age of a year.

Pathological anatomy.—The tumour is, as in the adult, scirrhus, often encephaloid; colloid or fibro-plastic tumours are also sometimes met with. A testis removed by M. Guersant was found to be three times the normal size; it was smooth and soft, and presented to the eye the appearance of a firm white tissue, resistant at some points, having a lardaceous aspect. In other cases, there was a soft, rose-coloured, almost diffluent encephaloid substance, interspersed with small bloodvessels, and readily breaking down under the fingers. The tunica albuginea appeared healthy under the microscope. There were also fibro-plastic nuclei and cells of irregular form and granular aspect, lying here and there among the tissue. Some red points formed by extravasated blood were also seen; no seminiferous vessels could be found. M. Guersant has not seen ulceration of the scrotum in such cases; but examples have been recorded. Nor has he met with chimney-sweepers' cancer, which, he says, is more common in England than among the French. On *post-mortem* examination of children who have died from a recurrence of the disease, he has found cancer in the lymphatic glands; sometimes also in the mesenteric glands, liver, etc.

Causes.—The causes of cancer in children are perhaps still more obscure than in adults. Cancer of the testis has been seen in children whose parents have not had cancer; hence the disease cannot be said to be hereditary in all cases. The violent bruising of an organ may sometimes cause its degeneration; and thus, if a child's testes became cancerous after a contusion, it might be admitted that this circumstance acted as a determining cause on a predisposed organ.

Symptoms.—These cancers passed unperceived in their commencement. Children are often brought to the surgeon as soon as an enlargement of the scrotum is detected, which has already lasted some time; it may therefore be said that the disease at first appears in the form of a painless tumour either on the right side or on the left. When an examination is made, there is found a rather heavy elastic tumour having twice the ordinary size, or more, of the testis; there is generally no change of colour in the skin; the venous circulation is slightly modified; and, in most cases, the scrotum is not adherent to the tumour. The tumour is easily felt separate from the spermatic cord, on which it drags more or less; it is at a considerable distance from the inguinal ring, and generally has a round, sometimes knobby, shape. M. Guersant has in general not found the tumours to be uneven, but other surgeons have done so. When the disease is recent, the glands in the groin are not engorged, and the cord is healthy; there is in general no fluctuation unless hydrocele be present. When, however, there is encephaloid disease of the testis, there is a feeling of softness which may be confounded with fluctuation; but the tumour is not transparent.

The *diagnosis* is sometimes difficult. If an exploratory puncture be made, little or no fluid escapes, and the instrument cannot be moved about freely.

Cancer of the testis, which is generally not nodulated, as are tuberculous tumours, is diagnosed from tumours met with in children who present other signs of tuberculosis, by the circumstance that, in the latter, the integument is adherent to a point corresponding to the softened tubercle; and that a more or less considerable projection exists, in which the surgeon can recognize fluctuation arising from the presence of pus. Inflammatory engorgement of the testis has a rapid development and progress; while cancer is indolent for a longer or shorter time. The presence of cancer might be obscured by a hæmatocele, and only discovered on operating; when it would be for the surgeon to avoid interfering with the disease of the gland, and, if possible, to relieve the hæmatocele alone.

The *prognosis* is as unfavourable in children as in adults. Of six patients operated on by M. Guersant, one, a child 18 months old, died of convulsions three days after the operation; he lost sight of one; and in the four others the disease has returned, either in the inguinal or in the deeply seated abdominal glands.

Treatment.—At first, especially if the diagnosis be doubtful, the preparations of iodine may be tried internally and externally. If this treatment succeed, the disease has probably been of scrofulous or tuberculous nature. In cases of cancer, castration is always necessary. In performing castration in children, M. Guersant makes an incision at the back of the scrotum, and prolongs it to the bone, unless it be necessary to remove a portion of the scrotum on account of the ulceration and adhesion of the testis. In this case, an oval piece of integument must be removed. When the organ is laid bare, the cord is isolated and cut across, the artery being tied separately, or the whole cord together with a double silk thread drawn very tightly. If any arteries besides the principal one be wounded, they must be tied separately, and the ends of the ligatures must be brought to the lower part of the wound, whither they will serve to conduct the pus. Three or four points of suture must then be applied; the scrotum enveloped in a fenestrated piece of linen covered with cerate, over which is placed some lint; and the whole must be kept in place by a suspensory bandage. To prevent inflammation, the dressing may be moistened with cold water; care being taken not to abruptly leave off this application, lest reaction set in and erysipelas appear. M. Guersant renews the dressing daily for some days; leaving only the sutures, which are withdrawn as cicatrization advances. In those patients of M. Guersant who recovered, cicatrization was rapid; suppuration was slight; and there were scarcely any constitutional symptoms. A return of the disease, however, occurred in every case of which he has been able to learn the subsequent history.—*Brit. Med. Journ.*, Dec. 16, 1865, from *Bull. Génér. de Thérap.*, 15 Novembre, 1865.

26. *Arterio-Venous Cyst in the Popliteal Nerve; Amputation; Recovery.*—Mr. C. H. MOORE communicated to the Royal Med. and Chirurg. Soc. (Jan. 23) the following case:—

A woman, aged 31, received a blow with an iron pump-handle in the middle of the ham. In a fortnight a painless, movable swelling, of the size of a hazel-nut, was found in the situation of the injury, and but for its distance from either hamstring, would have been pronounced to be an enlarged bursa. In sixteen months' time the tumour had increased, and seemed partly solid, and she first felt pain, which was referred to the foot. Three months afterwards, and twice subsequently in the following three months, the swelling was punctured, and on each occasion a yellow fluid, tinged red, first escaped, and as it flowed gradually deepened in colour, and continued to issue freely as blood from an open vein. The tension of the swelling was but temporarily reduced by these operations, and it increased in size so as completely to fill the ham, and protrude backwards in two prominent lesser swellings. The pain in them and along the leg and foot, the exquisite tenderness of the tumour, and a peculiar sudden pang shooting to the foot, while the canula was held motionless in the tumour, showed the nerve to be in some way mixed up with the swelling. After putting on a tourniquet, Mr. Moore made an incision into the tumour. Serum, black clot, loose fibrin, and some small custers of white corpuscles were dislodged, partly with the finger and partly with a copious rush of blood from a vein at some deep part of the large cavity which had been opened. This proved to be a thin cyst, with a shining interior membrane, expanded into alternate ridges and sacculi, and traversed like an auricle, or right ventricle, by many firm cords. It being impossible to dissect it out, and improper on account of the state of the woman's health to leave the sac to suppurate, Mr. Moore at once amputated the limb. The patient recovered. Upon examining the limb the disease was found to be a vast cyst within the popliteal nerve, shaped like a double cone, one continuous with the higher, and the other with the lower end of the nerve. The expanded and hypertrophied textures of the nerve constituted the cyst, and the cords passing through it and along its walls were disparted nerve-bundles. A large vein, having no valves between it and the popliteal vein, opened obliquely like the ureter, on the front of the cyst; and in the upper cone, where alone firm lymph was collected, an artery equal in size to the superficialis volæ opened into the cyst. The disease thus proved to be an arterio-venous aneurism, but unlike those which are more commonly observed in the small size of its artery, in the possible fact of venous blood having sometimes regurgitated into it, and in the unruffled quiescence of its contents, which had even separated into their natural constituents, almost as when blood coagulates after its withdrawal from the living body.—*Med. Times and Gaz.*, Feb. 10, 1866.

27. *Removal of the Entire Tongue for Epithelial Disease, by Means of the Ecraseur.*—Two cases of epithelial disease of the tongue, in which the whole organ was removed by Mr. PAGET, are recorded in the *Med. Times and Gaz.*, Feb. 10, 1866.

In remarking upon the operation, Mr. Paget said that he believed that which he had just done was suitable in the very great majority of cases in which it was necessary to remove the tongue for cancerous disease. Two points, however, must be attended to in performing it. (1.) The attachments of the tongue to the jaw, both in front, where there were the genio-hyo-glossi muscles, and at the side, where it was connected by the mucous membrane, must be thoroughly divided, so that the organ could be well drawn forward; and (2) care must be taken that the tongue was divided perpendicularly through its thickness; unless there was a definite provision to prevent it, the section would pass obliquely from behind downwards and forwards, and thus parts that had better be removed might be left. An efficient plan was to transfix the tongue perpendicularly with stout needles at the part at which the division was to be made, and to place the écraseur-wire behind these, so that it was made to cut vertically. There might doubtless occasionally be found cases in which the disease was situated so near the hyoid bone that it would be advisable to perform the larger operation recommended by Mr. Syme. Nevertheless, the écraseur operation allowed of complete removal of the sides and upper part of the tongue, and was therefore appropriate in the greater number of cases. The operation besides was attended with scarcely any risk to life.

The following is an extract from a clinical lecture lately given, on the subject of cancer of the tongue, at the hospital by Mr. Paget:—

"The motive to operate here, as in other cases, is either to prolong life, or, without shortening, to comfort what remains. For the first there is, I believe, some advantage—not a great prolongation of life, yet enough to justify an operation which is attended with very little suffering or risk. But the chief motive is in the hope of comfort, and the comfort that may be gained is, in many cases, so great as to justify a greater risk of life than is incurred in any of the ordinary operations for the removal of cancer of the tongue. The risk is really very small. I have not had a fatal case or witnessed one—there are few of even the minor operations of which I could say so much—and the comfort given is that the patient is delivered for the time from all the misery of one of the most distressing and disabling conditions of disease, and, till the cancerous growth is renewed, may enjoy complete health, and do all his work. Doubtless the disease will return after operation, but it is as unreasonable to refuse a painless operation, and one free from risk of life, because the disease will return at some time soon after it, as it would be to refuse a course of medicine because it gives only temporary relief. When a man has only, suppose, two or three years to live, it is no small advantage if at least half the time can be spent in comfort rather than in misery, and in profitable work rather than in painful idleness. Looking back on the many cases of cancer of the tongue that I have had to do with, I should be disposed to say that there is no organ on which operations for cancer are more justly performed, or are more to be urged, even in extreme cases.

"For the method of operating, the choice lies between cutting and the écraseur. Caustic is not to be thought of, unless in a case of the very smallest extent; and the cases in which the ligature should be used must be extremely rare. I have never employed it, for the only advantage which it offers, that of avoiding hemorrhage, is just as well, and much less offensively, obtained by the écraseur. The risks and troubles of hemorrhage are, however, much overrated, and I believe the knife may be preferred to the écraseur in all but the largest operations, such as those for the removal of the whole tongue."

28. *Excision of the Tongue.*—In our number for April, 1865, p. 500, will be found an account of a case in which Prof. JAS. SYME removed the entire tongue by excision on account of extensive disease of that organ. In a recent number of the *Lancet* (Jan. 27, 1866) the Professor gives a report of the then existing condition of the patient, showing the operation to have been eminently successful. The patient called on the Professor on the 10th of September, and announced who he was in a loud, clear voice. Very much astonished at the favourable state of the patient, the Professor requested a number of his medical friends to join him in examining the party. "Professor Goodsir and Mr. Nasmyth," he says, "having satisfied themselves that no vestige of the tongue remained, various observations were made with regard to articulation and other functions of the absent organ; and Mr. Annandale afterwards instituted a more particular inquiry, of which he has given me the following report:—

"'The lips and jaw-bone, where divided, were soundly united without any deformity. The opening between the mouth and pharynx was much diminished in size and irregular in shape from contraction of the fauces and soft palate, which were drawn downwards and forwards more to the right than the left side, from the mucous membrane at that part having participated in the disease and been removed along with the tongue. Mr. W—— says that he can swallow as well as ever, provided that the food is either finely divided or fluid. He is also able to masticate solid substances, although difficulty is sometimes experienced from their getting into awkward parts of the mouth. In ordinary speech his words are wonderfully clear and distinct, and he can sing without any difficulty. All the vowels and words composed of them are articulated perfectly, and also the following consonants: B, C, F, H, K, L, M, N, P, Q, R, V, W. D is pronounced 'dthe,' J 'the,' G like 'sjee,' 'S' is a lisp. His taste is impaired, but still enables him to distinguish different articles and their respective qualities, as grouse from partridge, bitters from sweets, good beer from bad beer, &c. He has remarked that the seat of sensation lies somewhere in the throat, since there is no recognition of taste previous to the act of swallowing; and, in order to ascertain the truth on this point more precisely, the following experiments were made:—

"'1. A strong solution of salt was applied by means of a camel-hair brush to the fauces, palate, floor of the mouth, lips, and inner surface of the cheek, with the result of something being felt in the mouth, but no idea formed as to its nature.

"'2. About a quarter of a teaspoonful of finely-powdered sugar was placed on the floor of the mouth, and, having been allowed to remain there a few seconds, was then brought thoroughly into contact with every part of the cavity without any recognition of its nature; but when a little water was added and swallowed, the taste was immediately perceived.

"'3. The same experiment was repeated with another substance (salt), and with the same result.'

"It has long been known that large portions of the tongue may be removed without destroying or materially impairing the power of articulation, but I am not aware of any case on record in which it has remained so perfect after complete removal of the organ. Of the facts above mentioned, the one that seems most curious is the connection between taste and deglutition; from which it appears that the latter is essential for the full perception of the former. If the pleasure of taste could be perfectly gratified by mastication without deglutition, there would be no limit to the consumption of food; but the instinctive desire to swallow an agreeable morsel affords a check to any such abuse."

Prof. S. gives also a representation of the microscopic structure exhibited by the tumour, showing that it presented the characters of epithelial cancer.

A remarkable case of removal of the entire tongue by Mr. Nunneley will be found noticed in our preceding number, p. 259.

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29. *Foreign Bodies in the Air-passages of Children.*—M. GUERSANT writes as follows on this subject in the *Bulletin Général de Thérapeutique* for September 15, 1865.

Foreign bodies in the air-passages may come from without or from the interior of the body; they are met with in the larynx, the trachea, or the bronchi. It is especially in children that they are observed; and they are of different kinds. The foreign bodies which come from the interior may be worms, which, ascending by the œsophagus, may pass into the larynx, and sometimes cause sudden death; or pus may come from an abscess in the neck; or a tuberculous product, first developed in a ganglion in the lungs, may penetrate into the larynx.

Foreign bodies may also come from the interior, having been first introduced from without; thus wounds in the chest sometimes give passage into the pulmonary tissue, to pieces of dressing, such as lint, etc., which then pass into the respiratory tubes; in the same way, pieces of necrosed bone may penetrate into the pulmonary tissue, to be expelled through the bronchi and trachea. A ball may follow the same path, in consequence of a wound in the chest. All such foreign bodies are often present without producing symptoms which may cause their existence to be presumed; still, when an abscess in the neck opens into the trachea, when retro-pharyngeal abscesses threaten to empty themselves into the larynx, or when foreign bodies enter from a penetrating wound in the chest, there are circumstances which put the surgeon in the way of forming a diagnosis.

Foreign bodies which come from without may be either fluid, soluble, soft, or hard. The fluids are water, wine, spirits, and all drinks. The soluble bodies are sugar, pieces of gum, pieces of sweetmeat of different kinds, pills, etc. The soft bodies consist of food more or less masticated. The solid bodies are raw beans, nuts, pearls, teeth, pieces of bone, money, etc.

Symptoms.—The foreign body lies in the larynx, or rather in the trachea. The signs which it presents are serious in proportion with the youth of the child and the narrowness of the tubes.

If the foreign body be fluid, the phenomena that it causes are a sharp irritation, a convulsive and suffocating cough, a kind of suffocation and *râle*, which disappear quickly on the expulsion of the fluid.

If the foreign body be soluble or soft, it causes nearly the same symptoms. Immediately after the accident there is suffocation, and the patient may die upon the spot; but ordinarily there is a violent, harsh, convulsive cough, with threatening of suffocation, appreciable by the patient and by the physician. The voice is hoarse or inaudible; there are anxiety, a feeling of fear on the part of the patient, with pain in the respiratory passage, sometimes localized by the patient, at other times of uncertain seat.

If the foreign body be solid, these accidents persist and even augment in intensity; but they vary according to the consistence of the body introduced. Substances which are soluble, such as sugar, gum, barley-sugar, and other *bonbons*, sometimes only cause symptoms of short duration; they dissolve, diminish in size, and are quickly expelled by the efforts of cough. The same may occur, but more slowly, with pieces of masticated meat and of soft bodies in general. M. Guersant has seen a child eject, for several consecutive days, pieces of masticated meat, and thus relieve itself by fits of coughing. He has also seen the same thing occur in a child who had eaten a sugar-plum with the almond, of which the pieces had entered into the larynx and trachea.

But it is not the same with hard foreign bodies; the symptoms already described not only persist, but cause other symptoms. A pin or a fish-bone may implant itself in the larynx and produce very severe inflammation; bodies of this nature may remain fixed at one point. Round solid bodies have a tendency to change their place; and these bodies pass from the larynx into the trachea, or remain in the ventricles of the larynx when they are small, or descend into the bronchi. It is in cases of this nature that foreign bodies change their places, giving rise to intermissions of the symptoms, leading to the belief that no foreign body is present, because the most frightful paroxysms of cough and of suffocation are succeeded by a perfect calm.

When the foreign body is in the larynx, the symptoms vary less, because the body does not become displaced; but when it is in the trachea, it may ascend or descend. On placing the hand in front of the neck, a sensation is felt of a body which rises and descends in the trachea. Sometimes these bodies descend into the bronchi, and do not move. M. Guersant has had an opportunity of ascertaining the presence of a bean in the left bronchus; in this child, the respiration was heard in the right lung only, while in the left there was an absence of respiratory sound. An attentive observation of the respiration ought to throw light on the nature of the case.

When foreign bodies are left to themselves, either in the larynx or in the trachea, they may be expelled by natural efforts if fluid or soft; but when they are hard, and remain of the same size or even increase in size (as kidney-beans), the symptoms increase in intensity; the paroxysms of suffocation are renewed; the patient is sometimes convulsed; the face becomes livid; there is lachrymation; the veins of the neck are distended, and the trachea projects more than in the normal state; the child makes very energetic efforts at expulsion. Air accumulates in the lungs, and distends their parenchyma. In consequence of rupture, the air penetrates into the cellular tissue above the clavicles, and into the chest, producing pneumothorax, and death may follow slowly; but, all other things being equal, more quickly in children than in adults, because of the smaller size of the organs.

The *diagnosis*, by aid of the means pointed out, is often easy enough; but too much attention cannot be paid to all the symptoms described. It is necessary, also, to attach the greatest importance to the information furnished by the persons who were near the child at the moment of the accident, and who have been witnesses of the first symptoms, as these are sometimes followed by the expulsion of the foreign body; in which case the symptoms which persist admit of delay.

It is very important not to confound the introduction of a foreign body into the pharynx with the introduction of one into the larynx. Ordinarily, in the case of a foreign body in the larynx, the pharynx and œsophagus are permeable to drink; but not so in the other. A bulky foreign body, however, such as a portion of a morsel of food may enter into the trachea, compress the œsophagus, and thus obstruct the passage into this tube, so that the patient cannot swallow without regurgitating. In a case of this kind, the trachea being distended by the foreign body, it is necessary to ascertain that the œsophagus is free, which may be done by introducing a gum-elastic sound into the alimentary tube; the substance, if in the œsophagus, may thus be pushed into the stomach, and the difficulty will be overcome, and the diagnosis rendered certain. If, on the contrary, this cannot be done, there will only be found in the œsophagus an obstacle, which cannot be pushed on; and it will be recognized that the trachea is distended, and compresses the alimentary tube.

Prognosis.—The severity in the case of foreign bodies in the air-passages varies with certain circumstances.

1. *Age of the Child.*—Very young children, a year old for instance, may meet with the most serious accidents, because of the narrowness of the larynx and trachea.

2. *State of the Health of the Child.*—A state of disease is unfavourable.

3. *Consistence of the Foreign Bodies.*—Fluids cause temporary symptoms only. Soluble bodies are less dangerous than soft; and hard bodies, which cause permanent symptoms, all present more or less danger. Those which have a smooth surface do not cause the same dangers as those which are pointed or rough.

4. *Size of the Foreign Bodies.*—They may, by their size, intercepting more or less quickly the passage of air, cause more or less rapid asphyxia.

5. *Duration of their Stay.*—When foreign bodies remain a long time, inflammatory or other complications are to be feared; but these may be prevented if they are removed at an early period. It is, however, known that foreign bodies have remained for months, or for years, in the respiratory tubes, and have been expelled by the efforts of nature.

Treatment.—When a child has a foreign body in the larynx, if the patient can be examined with the laryngoscope or Labordette's speculum, the foreign body, if at the entrance of the larynx, or even between the vocal cords, may possibly be seen with the aid of the last instrument, and seized with polypus-forceps. If this means be not at hand, the child should be placed with its head downwards, struck on the back, and caused to cough and cry. After this, emetics and sternutatories may be used, but without great hope of success; and finally, most frequently without delay, recourse must be had to laryngotomy, if it is thought that the substance is in the larynx, or else to tracheotomy, if it is believed that the foreign body is in the trachea or in the bronchi. In these operations, the rules must be followed which are laid down for the performance of tracheotomy in croup; and the surgeon must not forget to have at hand the small crane-bill forceps, as the foreign body may be impacted in a bronchus. Tracheotomy should be all the sooner decided on, as there is not such danger of failure as in croup, where the patient rarely recovers; indeed, in case of tracheotomy for foreign bodies, death is the exception, and recovery the rule. M. Guersant has had occasion to perform tracheotomy in five cases for the extraction of beans from the trachea; four patients recovered, and one died of pneumonia, who was operated upon sixteen hours after the accident. M. Guersant always applies simple dressing to the wound on the first day, and produces only gradual union. It may be united at once if the foreign body be expelled; and left open, and even kept open by a canula, if the foreign body still remain, and there be hope that it may yet be removed. After this operation, the surgeon ought to be on his guard against bronchitis and pneumonia; he should examine the chest daily, so as to be able to meet the earliest symptoms.—*Brit. Med. Journ.*, Dec. 2, 1865.

30. *Polypi of Larynx; Removal by Division of the Thyroid Cartilage.*—The following interesting case is related by Dr. Gilewski, of Cracow. A girl aged 16 came under his care, who had suffered during several months from hoarseness and noisy breathing (especially at night). At the anterior angle of the glottis were three polypous excrescences, partly of fleshy, partly of mucous aspect; one was larger than a pin's head, and the others were nearly of the size of peas. At each forced expiration they were carried somewhat backwards, but the epiglottis prevented them from being well seen with the laryngoscope. It was still more difficult, or rather impossible, to apply a ligature, on account of the violent reflex movements that were excited, and of the narrowness of the opening. It was, therefore, considered necessary to make an artificial opening for the removal of the tumours; and the operation was accordingly performed in December of last year.

The patient having been narcotized, an incision was made in the middle line of the neck, so as to expose a part of the thyro-hyoid membrane, the larynx, and the trachea as far as the second ring. No hemorrhage attended this part of the proceeding; and the patient had regained some consciousness. A sharp bistoury was now inserted at the upper edge of the cricoid cartilage, and the crico-thyroid membrane was divided as far as the lower border of the thyroid cartilage. Air escaped audibly through the opening. A probe-pointed bistoury was now introduced; and, the parts being held tense by a hook inserted above the second tracheal ring, the incision was continued to the upper border of the larynx. The patient began to cough and was very restless; but the hemorrhage was slight. Dr. Gilewski then held aside the divided parts by a hook inserted in the middle of each side of the wound, so as to be able to view the whole interior of the larynx. On making an inspection, Dr. Gilewski was astonished to find the mucous polypus, which had appeared as large as a pea, reduced to two small pale remnants of areolar tissue lying in the edges of the wound at the anterior angle of the glottis; near it was a nipple-shaped hard excrescence as large as a pin's head; it had a pale colour, as had also the neighbouring mucous membrane, which was in a slightly catarrhal state. No other tumour could be discovered; and the small one above described was removed by means of scissors. The disappearance of the larger tumour was attributed to its having been emptied of its contents, partly by the incision, and partly by the paroxysm of cough which attended the operation. A little watery fluid had been observed to escape when the incision was made into the thyroid cartilage. The operation was scarcely ended, when the patient fell into a syncopal state; this Dr. Gilewski attributed, not to the operation, but to the length of time during which anæsthesia had been kept up, and the quantity of chloroform which it had been necessary to use. She soon recovered under the use of ordinary means. The wound was united by strips of plaster, and a small dose of morphia was given. On the fourth day suppuration set in; and in the third week the external wound was closed. The patient remained free from fever; the breathing was perfectly easy; but there was some difficulty in deglutition. From time to time fragments of food entered the larynx, and were discharged by coughing through the external incision. As the closing of the wound advanced, the speech became more distinct; but there still remained some hoarseness, attributable without doubt to the fact that union took place much later in the thyroid cartilage than externally, and that the mucous membrane was in a congested state during the progress of the suppuration. On making a laryngoscopic examination four weeks after the operation, nothing could be learnt as to the condition of the parts, as the epiglottis was even still more inclined backwards than it had been. The cicatrix in the neck rendered the larynx fixed, so as to slightly impede deglutition. At the beginning of March the voice rapidly improved, and became clear and somewhat deep in proportion to the age of the patient. At the time of reporting the case, several months after the operation, there had been one transient return of hoarseness, attributable to acute catarrh.

In commenting on this case, Dr. Gilewski refers to the observations of Ranchfuss and Ehrmann, and expresses his opinion that in persons of advanced age there are not only great technical difficulties in the way of dividing the thyroid cartilage, but there is fear of the ready occurrence of perichondritis, and even of suppuration of the entire cartilage. The operation is contraindicated if there be reason to suspect hardening or ossification of the part. The division of the cartilage is best performed by means of a sharply cutting probe-pointed bistoury. the larynx being fixed by a hook. A director seems especially useless, as the operator's attention must be directed to two instruments, and the larynx must be steadied by an assistant. Moreover, the vocal chords escape by lying on each side of the bistoury, whereas, if the knife slipped from the director, it would not be possible to avoid wounding them. The larynx is best held open by simple fine sharp hooks, one fixed in each side of the incision. The wound is best united by plasters; but, if it be very long, there would be no objection to a suture. Anæsthesia is advisable only in the first stage, until the larynx is perfectly exposed. Consciousness on the part of the patient is of important service, should there be any hemorrhage during the principal part of the operation. In Dr. Gilewški's case, there was scarcely any hemorrhage, and he believes that none of any importance can occur while the two halves of the larynx are held apart.—*Brit. Med. Journ.*, Sept. 30, 1865, from *Wiener Med. Wochenschr.*, June 28 and July 1, 1865.

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31. *Wounds of Joints.*—Dr. WM. RUTHERFORD reports (*Ed. Med. Journ.*, Aug. 1865) some cases of this injury treated in the surgical wards of the Royal Infirmary, under the care of Prof. Spence, and concludes with the following remarks on the treatment of such accidents:—

"In treating a wounded joint, two objects are aimed at—to obtain primary union, and to prevent inflammation of the joint. For their accomplishment, local and general measures have been proposed, the former of which are the more important, and include rest, position, and cold.

"The employment of ice as the cooling agent is not a novel practice, but it is not so generally adopted as its merits appear to warrant.

"It is much to be preferred to irrigation with cold water, both because a *dry* cold is obtained, and a lower temperature produced, and because it can be much more easily and efficiently applied. With irrigation, the wound and surrounding skin are constantly kept in a sodden condition, so that primary union is frequently prevented, and a painful state of the skin often produced. Moreover, the patient is liable to catch cold, from his clothes and the supports of the limb being constantly kept soaking with wet; for, in the case of the knee and ankle, at least, it is almost impossible to confine the water to the limb, and prevent its wetting everything. With ice, everything can be kept perfectly dry, by inclosing the ice in gutta-percha bags, and by adopting the additional precaution of covering the wound with a large sheet of the same material, to prevent any accidental escape of water from reaching it. Were it even possible, however, to use irrigation without wetting the wound and surrounding skin, ice would nevertheless be preferable, on account of the lower temperature produced by it. When Cases 1 and 2 were under treatment, the supply of ice several times became exhausted, and during the intervals the joints had to be kept cool by irrigation, which was never adequate to prevent a rise in temperature, and the joints from becoming painful; the reapplication of the ice always depressed the former and removed the latter.

"The semi-anæsthesia produced by ice is generally sufficient to remove the pain until suppuration sets in; afterwards, its influence in that respect is not so decided. In order, however, to keep the patient at perfect ease, the bag must be promptly refilled as soon as the ice has melted; for, unless an equable low temperature be prescribed, pain is not completely removed; in some cases it is even exaggerated, and possibly the non-attention to this may, to some extent, explain the difficulty with which ice is borne by some patients of irritable temperament. The low temperature, so far from being hostile to the nutrient changes requisite for primary union, is, through its power of preventing inflammation, one of the best aids to primary union that can be adopted. During the late campaign in Schleswig-Holstein, the surgeons to the allied armies applied ice to all wounded joints, and to nearly every stump after amputation; and the general conclusion arrived at was, that where it was employed, primary union was more frequent and more extensive, and that the ensuing suppuration was always less. These results ensued whether the ice was supplied only until the commencement of inflammation, as practised by Langenbeck, or when it was kept applied until the wound had almost entirely healed by the second intention. The practice of continuing the application of cold after inflammation has set in has generally been considered a dangerous one by the surgeons of this country; but, contrary to what might have been anticipated, the cases treated on the principles of Esmarck succeeded almost as well as those where Langenbeck's practice was adopted.

"Joints wounded by gunshot are, of course, much less amenable to conservative treatment than where the wound is simply incised. In the former case, to be sure, the wound may be of such slight extent, as regards the joint, that they are not very formidable. There occurred, however, in the above-mentioned campaign, a gunshot wound of the knee-joint, of a very serious nature, which was successfully treated by ice. The patient, a young man, received a shot on the outer side of the thigh; the ball passed obliquely through the outer condyle of the femur, down through the knee, and out through the inner tuberosity of the tibia. Ice was carefully applied for many weeks until the wound had nearly healed, and complete recovery *without* anchylosis followed. Langenbeck was of opinion, that the synovial membranes having, in all probability, escaped injury, had favoured the happy result; but he at the same time attributed the success very largely to the careful application of ice from the commencement. That ice, however, is not sufficient to prevent inflammation, even in those cases where the wound is incised and clean, was evident from Case 2. There, however, as previously stated, the patient's constitution was largely to blame. It would, however, be worth while investigating, whether or not a lower temperature than that produced by ice might not advantageously be employed in some cases where the tendency to inflammation is unusually decided, either from constitutional peculiarity or the nature of the wound. We do not as yet know the lowest temperature at which a part of the body in a normal state may be kept by *dry* cold, without serious interference with its nutrition; still less do we know to what depth of temperature a wounded part may be safely lowered. Should it be found that a lower temperature than that produced by ice can be borne, its production could be effected without much difficulty by the employment of various frigorific mixtures, graduated according to the temperature required; and they could without difficulty be prevented from coming in contact with the wound, by inclosing them in thick gutta-percha bags, and by laying a sufficiently large sheet of the same material between the bag and the wounded part. In applying ice to a wound, common bladders ought never to be used if gutta-percha can be obtained, as they very soon allow the water to ooze through, and, notwithstanding the low temperature, soon undergo decomposition; moreover, gutta-percha is cheaper, and bags can be made very easily, by simply wetting the margins of the pieces to be joined together with chloroform, and holding them in apposition until they dry. In the removal of loose cartilages from the knee-joint by subcutaneous or direct free incision, were ice constantly applied to the part after the operation until all tendency to inflammation had ceased, the serious consequences which have so frequently followed these operations hitherto would in all probability be frequently averted; possibly also its employment might often be found serviceable after subcutaneous section of tendons and several other operations."

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32. *The Sequel in Some Cases of Excision of Joints.*—Perhaps the most interesting point connected with a surgical operation is the condition of the patient some years after its performance. It is exactly this point, however, which, owing to a variety of circumstances, is least often recorded. We are glad, therefore, to have the opportunity of noting the condition, at a very recent date, of some patients who underwent excision some years since.

In the year 1859, Mr. Thomas Bryant, of Guy's Hospital, excised the head of the right humerus from a man, aged twenty-three, on account of a chronic disease of the articulation of some months' standing. He adopted the single vertical incision through the deltoid muscle. The case did well. A few weeks since the patient came under observation, and it was learnt that he was then, and had been for several years, engaged as a coachman, driving a pair of horses. The arm was about an inch and a half shortened, but little or no difference was presented by the two shoulders. The man said that he could use the right arm quite as well as the left; indeed that he could lift a heavier weight with it. He could readily raise it to, but not above, the horizontal line. Mr. Bryant is disposed to think that the line of incision employed has something to do with the successful result. By the plan adopted the deltoid muscle is preserved, its fibres being separated rather than divided.

In August, 1861, Mr. Bryant excised the head of the femur for extensive disease of that bone and disorganization of the hip-joint, in a boy aged five years. The case was fully reported in the *Lancet* of July 12th, 1862. The boy recovered, and has been seen at frequent intervals since. He has now a very useful limb. He can walk and run with facility, and stand upon the affected limb without inconvenience. The leg can be raised as high as its fellow, and rotated with perfect ease. The limb is nearly two inches shortened, but with a high-heeled boot the deformity is little noticed.

A carter, sixty two years old, came under Mr. Bryant's care in August, 1859, with disease of the right elbow joint following an injury. There was great enlargement and pulpiness about the articulation, with numerous fistulous openings, through which exposed bone could be detected by a probe. Movement of the joint caused crepitation and great pain. The patient refusing to have the joint excised, the arm was fixed upon a splint at an appropriate angle, and constitutional treatment adopted. For three years he persisted in this treatment, but without improvement, and eventually in May, 1862, consented to excision, which was performed. The patient was very troublesome after the operation, refusing to wear a splint, and in other respects disobeying instructions. Nevertheless, a steady convalescence followed, the wounds healing, and the soft parts recovering their natural condition. In six months movement was complete, and he returned to his occupation. When seen recently, it was found that he had been engaged at his work without feeling any inconvenience. He could wield his whip with skill, and it was difficult (looking at the arm) to believe that excision of the joint had been performed.

A man, in whom Mr. Timothy Holmes, of St. George's Hospital, excised the shoulder-joint for extensive disease of the articulation about two years ago, is now employed as a gate-keeper at Kensington Museum. He has a wonderfully useful arm, being able to do almost anything with it. There is some motion at the seat of the joint, but Mr. Holmes thinks that in this and similar cases the essential power of mobility is derived from increased freedom in the movement of the scapula upon the back.—*Lancet*, Jan. 6, 1866.

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33. *Trephining the Spine.*—In our number for October last, p. 537, will be found an interesting case of this operation performed by Dr. R. McDonnell, of Dublin.

Another case has recently (Nov. 28th, 1865) been reported to the Royal Medical and Chirurgical Society, by Dr. SAMUEL GORDON. This case is that of a man 31 years of age, who met with an injury of the spine on the 27th of March, 1865. He was thrown from a horse into a ditch while hunting, and was immediately affected with paralysis of the lower limbs, rectum, and bladder. When admitted into the Whitworth Hospital, under Dr. Gordon's care, these symptoms still continued, a bed-sore had formed, and there was incontinence of urine, which fluid was alkaline, and contained copious muco-purulent deposit. One of the vertebræ in the lower part of the spine was displaced. The extent to which the spinous process projected was shown in a cast exhibited. Dr. Gordon performed the operation of trephining at the patient's urgent request on June 3d. The operation lasted fifty minutes, and was not accompanied by much hemorrhage. Soon after the operation signs of improvement were noticed. On the fourth day after it the urine became acid, but this condition did not continue; sensation improved, and some days later there was observed an increase of motor power. After some time the urine, which was sometimes alkaline, sometimes neutral, became permanently acid, power over the bladder was restored, and the patient was conscious of the passage of feces. Within eight weeks he was able to go out, reclining in a basket carriage. He has now regained control over the bladder, and he can sit erect with ease and comfort; but he cannot stand, or of course attempt to walk. His general health is excellent.

In making observations on this case, Dr. McDonnell draws attention to the following points:—

1st. There is nothing in the operation of a necessarily fatal kind; neither is it of necessity followed by exfoliation of bone, formation of matter, &c., which makes convalescence very tedious, if not impossible.

2d. He thinks that even those who do not advocate the operation in question must admit that in this case the operation was the cause of improvement.

3d. Judging from our present experience, he recommends that in future cases the operation should be performed early, before structural change has taken place in the cord, and the muscles have fallen into a state of atrophy, from which it is difficult for them to recover.

4th. He advocates removing the posterior arches of more than one vertebra as a proceeding which adds little to the difficulty or severity of the operation, and nothing to its danger, and which gives the patient a better chance of ultimately being able to stand and walk.

Mr. Spencer Wells stated that in the course of his service in the navy, and in the Eastern hospitals during the Crimean war, many such accidents had fallen under his (Mr. Wells's) notice, and he did not remember a single instance of recovery. Some lived several months in great misery, but he did not remember one patient who lived a year; and such cases as those alluded to by Mr. Barwell and Mr. Shaw must be quite exceptional. The only instance of recovery he had met with was in a gentleman who met with a fall when hunting. Inflammation and caries of the intervertebral substances and bodies of three of the dorsal vertebræ followed, and paralysis, which lasted two years. But recovery was so complete that the gentleman lived for twelve years afterwards, married and had a child, rode, danced, and shot, and only died last year of Bright's disease. The spine (which was exhibited at the meeting) showed that the whole of the body of one vertebra and half of two others had been destroyed, and that these two were very firmly anchylosed. Whilst this case proved the possibility of recovery, it was rather to be taken as an encouragement to Dr. Gordon and Dr. McDonnell that the man whose case was before the Society would completely recover power over his legs than as supporting the views of Mr. Shaw and Mr. Barwell in favour of non-intervention. It was very hard upon a surgeon, who might be blamed if an operation was not successful, to discourage him when it was successful by saying that the patient would have done just as well if he had been left alone.

Dr. R. McDonnell observed that he was greatly gratified, not only at having been able to be present, but at the discussion which this case had elicited. He expressed some surprise that those who were opposed to operation in such cases had not laid more stress on the mechanical objections urged against it by Sir Benjamin Brodie in his well-known paper, viz., that as the body of the vertebra was, in the vast majority of cases, the seat of fracture, and as this part was out of reach, no good could be gained by operative interference. It was quite certain that in such cases it was only that part of the vertebra against which the cord is pushed back that could be removed; it was only, in fact, possible to take away the counter-pressure. But this mechanical objection took no accouut of the cases which, although forming a very small proportion of the whole, yet sometimes occurred, in which the body is not broken, the posterior arch being the part fractured. Boyer had recorded such a case. While the operation of trephining the spine, as it is called, is set aside in practice, as it virtually has been, such cases must be lost which might otherwise possibly be saved. He did not conceive that any advocate for the operation would think of performing it in any case where the symptoms of compression of the cord did not exist. It would be less justifiable in such a case than it would be to trephine the skull when there existed no signs of compression of the brain. In reference to the case alluded to by Mr. Barwell, he could only say that the experience of those who had the largest opportunities of seeing such cases, as well as the shelves of the museums of Europe, showed how rare such cases were. In his own limited experience, he had never been fortunate enough to see a case presenting such features as Dr. Gordon's case did just before the operation which had not run a fatal course. Dr. McDonnell did not think it probable that at a period of two months after fracture of the spine any considerable attempt at consolidation had taken place in most instances. It generally happened that the intervertebral substance was more or less lacerated, and the first thing nature does before setting about the work of consolidation, is to absorb the lacerated intervertebral substance. This is always accomplished slowly; and even when patients lived five or six months after the injury, consolidation was sometimes found to have made but little progress. Dr. McDonnell hoped, and, indeed, from the character of the discussion on the case just detailed he hardly doubted, that some of the surgeons connected with the hospitals of this great metropolis, profiting by the experience of his own and of Dr. Gordon's case, would undertake to perform the operation in question, and he earnestly hoped that, improving upon what had been already done in this field, they might obtain successful results.

34. *Ovariotomy in Relation to Disease of both Ovaries.*—Professor von SCANZONI, while admitting the great progress which has been made of late years in establishing ovariotomy as one of the great recognized surgical operations, calls attention to its inferiority as a means of radically curing a fatal disease when compared with other important operations, as the Cæsarean section, lithotomy, the larger amputations, and the ligature of great vessels. When the immediate danger of these has been triumphed over, the patient has a reasonable expectation of being cured of his disease; but thus much cannot be said of ovariotomy, owing to the probability of the second ovary being diseased. This point has been insufficiently inquired into, and the object of this paper is to call attention to it. At present, great difficulty exists in drawing any conclusion upon the matter, owing to the few accounts which we have of the after-history of those who have been operated upon. Thus, in Dutoit's statistical work, embracing 324 cases of successful ovariotomy, in only 34 instances is the state of the patient declared two years after the operation. No conclusion can be drawn from such insignificant numbers, and Professor von Scanzoni has endeavoured to throw light upon the matter by causing the register of the Würzburg Pathological Institute to be searched. In the course of fourteen years the autopsies of 99 cases of ovarian disease were recorded, and in 48 of these the disease was found existing on one side, in 51 on both sides; and von Scanzoni is convinced that this statement does not represent all the cases of disease of the ovary brought to the Institute, nor a sufficiently high percentage of double disease, this not being noted when slight and incipient. At all events, in one-half of the cases recorded the ovary was diseased on both sides; and this point, with the probability of relapse it implies, has been too little regarded by surgeons. These 99 cases are divisible into two groups, accordingly as the subjects had reached their fiftieth year or not; 52 of the number were below and 44 above that age, this point not being indicated in three cases. In the 52 cases both ovaries were diseased 31 times, or 59.6 per cent.; and but one 21 times, or 40.5 per cent. In the 44 cases, in 17 both sides, and 27 one side, were affected, or 38.6 to 67 per cent. A conclusion to be drawn from these figures is that, as double ovarian disease is of so much more frequent occurrence prior to the menopausis, the danger of relapse is much greater before than after that period—a fact to be borne in mind in considering the indications and contraindications of the operation. It may be said that if, during the operation, both ovaries are found diseased, they may be at once extirpated, and all danger of relapse obviated. In Dutoit's statistics this double operation is said to have been executed in 25 cases, with 11 recoveries and 14 deaths; and it is remarkable that this double operation should have been performed in so small a proportion of cases, seeing, from the statistics already adduced, that disease must have existed much oftener in both sides. Either the diseased condition of the ovary must have been overlooked, or fears were entertained of aggravating the danger of the operation, or hopes were entertained that the disease would not undergo a dangerous development. However, the double extirpation seems to have been followed by bad results in the few cases in which it was undertaken, for there were only 44 per

cent. recoveries to 56 per cent. deaths: while the entire number of ovariotomies recorded, 468, furnish 262 recoveries and 206 deaths, or 56 per cent. to 44—the figures being exactly reversed.

Professor von Scanzoni appeals to all those who may have the opportunity, and especially to the English surgeons, for their aid in a thorough examination into the point which he has raised in this paper.—*Brit. and For. Med.-Chir. Rev.*, Oct., from *Würzburg. Med. Zeit.*, No. 1, 1865.

OPHTHALMOLOGY.

35. *Changes which take place in the Fundus of the Eye in Progressive Myopia.*—Mr. Rouse read before the Western Medical and Surgical Society the following series of cases illustrating this.

Case 1. A girl aged 18, came in January last to the Ophthalmic Hospital. She had noticed myopia for six years: it had increased much within the last few months. She had tension in the left eye, with rings of light passing before the eye towards night, and obscure pain in the globe. The ophthalmoscope showed well developed crescentic posterior staphyloma on the outer side of the optic disk, between which and the yellow spot was great hyperæmia of the retina, also increased vascularity of the optic disk. Purgatives, blisters, cold douches, and omission of reading and needlework, removed the symptoms without increase of the staphyloma.

Case 2. A female, aged 25, had always (within memory) been myopic, and had used her eyes much for fine work. The right had been becoming worse more than five years, but during the last six or eight months so much so, that she could not see to work. She saw floating spots and flashes of light. The ophthalmoscope showed a small white optic disk, a well-defined staphyloma, and small yellowish white patches with pigment spots scattered over the fundus.

Case 3 was that of a myopic lady with cataractous left eye, and history of pain, flashes of light, and muscæ of many months' duration. The examination of the eye showed staphyloma, with congestion of the whole fundus and optic disk. The globe was rather tense, and there was some ciliary neurosis. Leeches, blisters, and purgatives relieved the tension and hyperæmia, but the flashes and muscæ still appeared from time to time.

Case 4. A woman, aged 40, of anxious temperament, found the sight of the right eye to be affected three days before she presented herself, and in a few hours it was quite gone. Her myopia had always caused her to hold her work four inches from her eyes; her sight was so acute that she was employed for the finest work. There was very little pain. On examination, one-half of the retina was found separated from the choroid, quite concealing the yellow spot and three-parts of the optic disk. In the left eye there was a small hyperæmic optic disk, but no posterior staphyloma. She was free from any organic disease of the viscera. Blisters and the iodide of potassium in two weeks removed most of the fluid. The detached retina was lying in a sort of fold. This patient is still under treatment, with, as yet, little improvement of vision.

Mr. Rouse said all symptoms in myopia should be attended to. It was an error that a near sight is a strong sight, and will improve. He showed that glasses were needed, and gave rules for their use. An occasional leech to the temple, purgative, and complete rest in a darkened room, were all useful. Paracentesis might be required. Myoptic patients should not hang their heads down.—*Brit. Med. Journ.*, December 16, 1865.

36. *Physiology and Pathology of Certain Forms of Dilated Pupil.*—Dr. Jos. Bell, Assist. Surg. Royal Infirmary, has published (*Edinburgh Med. Journal*, April, 1865) some interesting remarks on this subject.

"Mydriasis or dilated pupil," he remarks, "whether we consider it as a disease, or as a symptom merely, may result either—

"1. From paralysis of the sphincter pupillæ—M. paralytica.

"2. From irritation or contraction of the radiating fibres—M. spastica.

"Under these two heads I will briefly group the chief maladies in which mydriasis is present.

"1. M. paralytica—with partial or complete paralysis of third nerve, very frequently accompanied by ptosis, and rarely by protrusion of the eyeball from want of muscular tension.

"*a.* Ordinary cases of ptosis, resulting from periostitic nodes, either syphilitic, or simply rheumatic.

"I would specially refer to some cases recorded by Mr. Workman, in vol. iv., part first, of the *Ophthalmic Hospital Reports.*

"*b.* Cases of brain disease or injury accompanied by compression, as in certain cases of hydrocephalus. See Mackenzie under the head of 'Hydrocephalic Amaurosis.' And this also explains the dilated pupil, so well known as a symptom of traumatic compression of the brain from hemorrhage.

"*c.* Result of intra-ocular pressure, in cases of glaucoma, with excessive hardness and tension.

"*d.* Cases of actual paralysis of the sphincter pupillæ itself, the result of excessive tension during the removal of the large hard lens in the operation of extraction.

"*e.* The well-known dilatation, the result of sudden and excessive retinal apoplexies. The very existence of such cases was unknown till the ophthalmoscope cleared them up, before which they had been called sudden cases of amaurosis, or perhaps had been put down to the credit of mydriasis simple, the dilatation being the only visible change.

"Perhaps it is better to ascribe the dilated pupil, in these last cases, rather to the fact that the retina no longer receiving the stimulus of light, or at least being unable to transmit it to the brain, the third nerve does not receive any impulse from the brain, and therefore does not contract the pupil, than to the idea of the retinal apoplexy producing any intra-ocular pressure.

"2. M. spastica—from irritation of the fibres of the sympathetic which supply the radiating muscular striæ.

"Such cases are much rarer, and not so well authenticated.

"*a.* Cases of dilated pupils coincident with the existence of worms, and other gastric derangement in children.[1]

"*b.* Soelberg Wells, in *Ophthalmic Hospital Reports*, ii. 304, refers to an observation of Graefe's, who had pointed out that mydriasis specially of one eye sometimes precedes mental alienation.

"*c.* We may perhaps include here some of those rare and curious cases in which pain in, or extraction of, a tooth has been followed by total and sudden blindness, with fully dilated pupil. One of the earliest recorded cases is to be found in Wirgman's translation of *Heister's Observations*, p. 193; the date of the case is 1712.

"Now, the cases I have recorded here cannot well be classed under any of the preceding heads which I have so briefly sketched. They have all occurred in strong, otherwise healthy patients, in whom there was *no* evidence of any cerebral change; no muscular paralysis; no ptosis, protrusion, or strabismus; very little or no intolerance of light; from the immediateness of the cure, there could be nothing glaucomatous; and in all the cases one eye only was affected.

"Like the scrivener's thumb, I believe it is a case of peripheral, not central, paralysis. Two *certainly*, the other two cases probably, had been under special circumstances of overwork. It is not hard to find an explanation of the paralysis being confined to one eye only, when we remember how often a very slight difference in focal length or adjusting power causes the whole of the work at a given distance to be thrown on one eye only. This also explains the manner in which the Calabar bean, as a local excitant to the ciliary nerves supplying the sphincter pupillæ, causes a cure, in the same manner as atropia is now nearly universally acknowledged to act both locally and generally as an excitant of the vaso-motor system of nerves. On this cognate subject, I would refer to the papers published in the *Edinburgh Medical Journal* for 1857, by Mr. Bell.

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[1] Plenck (Vienna, 1783) speaks of M. verminosa, "quae a saburra verminosa primarum viarum nascitur."

"So far, then, good. Granted your local paralysis of the iris, the Calabar bean, your local excitant, sets *it* working again; that is surely enough. You get the pupil to contract, vision is restored; it is solely a paralysis of the iris, and of it only the circular fibres. If I were to stop here, I would stop too soon—fail to illustrate a very interesting physiological point, and give an argument in favour of a theory which I firmly believe to be wrong.

"For, could we say it was the iris alone that was paralyzed, we would have paralysis of the iris causing want of accommodation, removal of the paralysis restoring accommodation, a very important contribution indeed, were this the case, to the vexed question of the agents of accommodation. It stands, briefly, somewhat thus:—

"1. Is accommodation of the eye to distance the result of a change in the *position* of the lens, or in its *shape?*

"2. Is the change, whatever it be, the result of the action of the muscles of the eyeball, of the iris, of the ciliary body?

"Without going into detail, I merely remind you that Cramer stands up for the iris as the chief agent; and at first sight these cases of mine would seem to favour this view. But—

"1. Von Graefe has put on record a case of very great interest, in which the whole of the iris was removed. Yet, vision in that eye, a very few days after, was found remarkably good, and the accommodative power *almost* perfect. I would also refer you to a very interesting case recorded by Mr. George Lawson (*Ophthalmic Hospital Reports*, iii. 272), of congenital absence of the iris in both eyes, in which accommodative power was fair, and very much better than in the mildest case of the form of mydriasis at present under your notice.

"In short, we may almost go the length of the observation by Becker (translated by Windsor, and abstracted in the third part of vol. iv. of the *Ophthalmic Hospital Reports*), 'the motions of the ciliary muscle and iris are associated and occur in co-operation, yet the iris has no direct influence over the alterations in the form of the lens;' and,

"2. The following point of great interest was noticed on every occasion of the use of the Calabar bean in the cases under review, that vision and accommodation were restored a few minutes *before contraction of the pupil commenced at all.* This was observed by Dr. Argyll Robertson, in his experiments with the Calabar bean on his own eye, that vision was affected and rendered myopic before the pupil was visibly altered. We are thus driven to look for something else by which to explain the symptoms and their removal, and we find it in the *ciliary muscle.*

"Supplied by the third nerve, like the sphincter pupillæ, it sympathizes with the iris in its troubles, and also in its relief; and it has, what the iris has not, a very special function in the mechanism of accommodation. Though not so visible, the action of the Calabar bean solution, applied locally, is more rapid on the ciliary than on the iris, and by the removal of its paralysis the power of accommodation is most rapidly restored.

"While on the subject of dilated pupil and its treatment by the Calabar bean, I may just notice other means that have been used for its relief. Opium dropped in, with very little success. Attempts to cause contraction of the pupil by irritation of the branches of the fifth, which are supplied to the eyebrow and nose. Admission of bright light into the affected eye is more apt to injure the retina than to cause contraction. Use of convex glasses for reading small print held near the eye. None of these, in their results, have proved either so rapid or so satisfactory as the local use of the Calabar bean.

"There is an interesting but somewhat rare accident, hitherto irremediable except by mechanical means, which this same agent may probably render amenable to treatment. I refer to those cases in which, from blows on the eye, the inner free margin of the iris is ruptured, and *part* of the sphincter pupillæ at least is rendered useless, followed by dilatation of the pupil and disturbance of vision. This is not nearly so common an accident as detachment of the ciliary border, but still is frequent enough to deserve comment.

"Experience has yet to show us how far the early and persevering use of the solution of Calabar bean may avail in restoring contraction, or, at least, in preventing excessive dilatation. It is true that such cases are frequently accompanied by, and complicated with, retinal detachment and extravasation, but the dilatation has been found to be very lasting and extremely annoying.

"Mr. White Cooper has recorded three interesting cases of this accident in the *Association Journal* for 1855. The only palliation hitherto discovered has been the use of an artificial diaphragm. consisting of a spectacle frame fitted with an opaque plate, and containing an aperture corresponding to the pupil, either circular or a mere transverse slit.

"Experience alone will prove the value of the solution of the Calabar bean in such cases, but it is certainly well worth trying. The cases I have recorded in this paper have proved its power in the treatment of unilocular mydriasis."

37. *Atropia Points.*—Mr. J. Z. LAURENCE has lately had made pencils or points impregnated with atropia which he says recommend themselves by their simplicity and portability. These atropia points are like nitrate of silver ones, adaptable into wooden holders, and may be carried in the waistcoat pocket. If one of these be lightly pressed once or twice over the conjunctiva of the lower eyelid a sufficient quantity of atropia is washed off to dilate the pupil.—*Ophthalmic Review,* Jan. 1866.

MIDWIFERY.

38. *Use of the Wire-Ribbon in some Cases of Difficult Turning.*—Dr. HEYERDAHL, of Bergen, communicated to the Edinburgh Obstetrical Society a paper on this subject. He states that he was attending in the country a case of transverse presentation which had gone on for a considerable time unrelieved—the waters had flowed away two days before. "The pains had been rather energetic for the last twelve hours, with strong bearing down. I found the left shoulder presenting low down in the vagina, and considerably swollen; the uterus and os firmly embracing the fœtus. The fœtal heart was heard indistinctly about the umbilicus. I put the woman—a strong primipara at the term of gestation —under the influence of chloroform, and proceeded to turn. It was impossible to push the bulk of my hand into the uterine cavity, although the bearing-down pains were very much lessened; but with two fingers within the os I reached and got hold of one foot, aiding this purchase by forcing the pelvic extremity of the fœtus lower down with the other hand. So far I succeeded; but I soon found that I wanted strength enough in my finger to bring the foot farther down than to the brim, the foot being in such a degree slippery that I lost my purchase every time I tried to pull down. At the same time it was impossible to raise the presenting shoulder up to get a little more room. I tried in vain to bring up a tape round the ankle. I failed repeatedly on account of the looseness of the tape, moistened in the discharges from the vagina."

It occurred to him to try wire-ribbon used by milliners to shape bonnets.

"I took," he says, "about a yard of wire-ribbon, half an inch broad, doubled it up, and formed it into a running noose. I made the loop a little elongated, and large enough to slip a foot through, and twisted the free ends a little to give them more stiffness. I now succeeded in sliding the well-oiled running noose of wire-ribbon up to the foot, and to get a firm hold of it, and then, by moderately pulling on the foot, securely grasped in this manner, and at the same time pushing the presenting shoulder upwards with the other hand introduced into the vagina, I was fortunate enough to turn in no time. Soon after, the child was born by nature alone, with the exception of a little manual force to extract the head. The child was dead; but the patient did well, according to the report given me two days thereafter.

"This case is, I think, of some interest for the practitioner, because it proves that the difficulty of grasping the foot high up in the vagina by a running noose of tape—sometimes baffling our best endeavours—may be overcome without instrument in so simple a manner, namely, only by substituting the material commonly used, tape, by another equally simple material, wire-ribbon, to be procured wherever bonnets are worn.

"Of course the method of applying wire-ribbon may be modified in different ways; for instance, by doubling the wire-ribbon, then twisting it in its whole length, only the uppermost portion being left untwisted and forming a loop. To the other end is fixed a handle, made of a small piece of wood. This little apparatus is used in the same manner; the only difference is, that the loop is tightened by augmenting the number of twistings by turning the handle. The material possesses this quality, that the twistings, once made, do not untwist again, and thus the foot is securely and firmly grasped.

"But I am inclined to think that the method put into execution in my case is perhaps the simplest, and, therefore, also the best.

"Should the stem of the running noose give too much during its introduction, this inconvenience may be remedied by using a small surgical forceps to introduce it with.

"There is one drawback to its use: wire-ribbon is sharper and more apt to cut than common tape, and I was obliged to protect my hand by means of a handkerchief. Around the ankle of the child was left a deep furrow, but it had not cut through the skin.

"By applying the wire-ribbon running noose to the feet of the dead body of the child, I was not able to cut through, although I purposely used much more force, and for longer time, than advisable in any circumstance connected with the operation of turning a living child.

"If instruments can be dispensed with, it may be a step in advance in the technosis of turning, and worthy the notice of the profession."—*Edinburgh Med. Journ.*, January, 1866.

39. *Influence of Chlorate of Potash on the Life of the Fœtus in Utero.*—Dr. Bruce read before the Edinburgh Obstetrical Society a paper on this subject, and read accounts of six cases in which he had used that article with a view of prolonging the life of the fœtus.

These, he says, "are all the cases I can refer to at present, and they are much too few to draw any satisfactory conclusions from; but I think they are interesting, in so far as some of them, under the use of the chlorate of potash, ended so much more satisfactorily than they had ever done before, where some had become mothers of healthy children, which a succession of previous miscarriages had well-nigh made them despair of. How far these cases may have been influenced by the remedy employed I will not venture to say, but the result of the practice appears to me to be of an encouraging nature; and in any other cases of the kind which may come in my way, I shall feel strongly inclined to follow out a similar treatment."

Dr. And. Inglis said he had never seen the chlorate of potash fail. Even in one case, where, after sixteen still-born children, the seventeenth was born alive.

Dr. Sidey thought it was always useful.

Dr. Cairns mentioned a case where a woman had aborted five times, but after the use of this medicine she carried her sixth child to the eighth month.

Dr. Moir stated that he had used chlorate of potash in very many cases, and thought it did good.

Dr. Keiller remarked that he had very frequently administered chlorate of potash, for the purpose of preserving the life of the child in utero until the period of its viability, if not to the full time, and his experience led him to continue the practice. It was a matter very difficult to determine whether any undoubted evidence existed to prove that the mother's blood was oxygenated by the use of the chlorate of potash to the extent of acting on the placental structures, or their circulating fluids, so as to influence in any degree the vitality of the child. It might be as he (Dr. K.) had, on former occasions when this matter was before the Society, hinted at, that the health of the mother happened to be in better condition on the particular occasion when a living child was born, or that the patient's health was benefited by the alterative or tonic influence of the salt referred to, without the supposed directly oxygenating effect of the remedy on the blood of the child. The condition of the mother's health was not specially mentioned in the cases cited by Dr. Bruce; but he (Dr. K.) thought it important to take this into consideration while estimating the value to be attached to the use of the chlorate. Dr. Keiller had often noticed that the health and spirits of females treated in this way improved very materially; this might be partly brought about by the taking of a remedy likely to promote the chance of ultimately getting a living child, for we all know the wonderfully tonic power of lively hope on the one hand, and the depressing influence of mental anxiety and dread on the other. The mere giving of a something, and the encouraging the idea of its remedial power, often acted like homœopathic charms, the patient being induced to go more about, and thus, also, favour the chances of the general condition of her health being improved. Dr. K. had at present a case in hand, the result of which he would afterwards communicate to the Society. The patient had lost seven children, and was now between six and seven months in her eighth pregnancy. She had, for the second time, come from Australia to undergo treatment likely to lead to the desired end of having a viable child. The patient was now taking the chlorate of potash in much larger doses than those spoken of by Dr. Bruce. For some time past he (Dr. K.) had been in the practice of administering the chlorate to the extent of several drachms daily in a very diluted form, the patient using it freely as a common drink.

It was very important, while watching the progress of cases, to beware of being misled by the *active movements* of the child to which Dr. Bruce had referred, as if this amounted to unfailing evidence of its safety. It often happened that immediately preceding death the fœtal movements became convulsive, or unusually strong, which, indeed, in many cases was a suspicious sign. This ought studiously to be kept in mind, for although gradual feebleness or loss of movement was usually the most noticeable sign of the child's dying, extreme or convulsive plunging frequently indicted the advent of death.

The condition, not only of the child, but of the uterine circulation, as ascertained by the use of the stethoscope, ought to be frequently seen to, and the general or constitutional evidence of fœtal danger or death should in such cases be observed.

The frequency of syphilitic influence as a common cause of fœtal death demanded our attention and remedial care. At the same time, the chlorate of potash, if it did not do away with the necessity of administering other or more special syphilitic remedies, did not interfere with their use in cases where constitutional taint from syphilis was found or supposed to exist.—*Edinburgh Med. Journ.*, January, 1866.

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40. *Procidentia Uteri.*—Dr. J. MARION SIMS read before the Obstetrical Society of London (Dec. 16, 1866) a paper on this affection. He said that a procidentia was complete when the vagina was inverted and formed its outer covering—incomplete when the cervix only passed through the vulva; that a broad pubic arch, divergent rami, a relaxed perineum, and a retroversion, were essential to its production; that in some cases the infra-vaginal cervix was elongated, and came down first, but that in the majority of chronic cases a vagino-cystocele formed the first stage of procidentia. For the first he advocated amputation of the cervix, and said this was generally alone sufficient; but for the second he preferred to narrow the vagina. This idea, he said, originated with Marshall Hall; but he did not think the operation had ever succeeded till the introduction of metallic sutures. He then gave an account of the operation from the time he first performed it in 1857 till now, showing its gradual advancement to its present state of perfection. He illustrated the subject fully by diagrams. In 1857 he narrowed the anterior wall of the vagina by exsecting a large ellipsis of it, and then bringing the lateral borders together with silver sutures. Afterwards he simply denuded the surface of its epithelial membrane; then he simplified the operation by making a V-shaped scarification; and consequently he made it trowel-shaped or triangular, the point being at the neck of the bladder, and the broad portion in juxtaposition with the cervix uteri. In all these methods, the object was to remove the cystocele, and afford a support

to the parts just at the anterior cul-de-sac. By diagrams he illustrated the method of operating, and claimed for it, when properly done, the greatest success. He did not pretend to institute a comparison between this and the perineal operation for the same trouble; but he had been driven to work out this plan in consequence of having often failed with the other. He only wished to add another resource to our means of curing such a disgusting infirmity, for we now had three methods: 1st, amputation; 2d, the perineal operation; 3d, the narrowing of the vagina, as advocated by him.

Dr. S. said that no one method of operating could be applicable under all circumstances to all cases. If there was a lacerated perineum, it was proper to restore it. If there was elongation of the infra-vaginal portion of the cervix, then the proper operation was amputation of the cervix, and this was probably all that was necessary in such cases. In the majority of cases of procidentia—in all those where a vagino-cystocele formed the first stage of descent—he was satisfied that the operation he had described, viz., that of narrowing the vagina by forming a longitudinal fold of its tissue on the anterior surface, reaching from the neck of the bladder to the neck of the womb, would be one of the safest, simplest, and best.—*Lancet,* Dec. 16, 1865.

HYGIENE.

41. *Application of Ozone to Sanitary Purposes.*—Dr. John Day describes (*Lancet,* February 3, 1866) the following simple and inexpensive method of generating ozone and of applying it to sanitary purposes:—

"Schönbein found that a little pure ether put into a bottle filled with oxygen or atmospheric air, and exposed to diffused light, the bottle being occasionally shaken, had partially changed its nature after a lapse of four months. Although producing no action on litmus paper, it discharged the colour of a solution of indigo, converted phosphorus when immersed in it into phosphorous acid, eliminated iodine from iodide of potassium, &c.; thus showing that it had acquired many of the properties of ozone. This discovery led to a mode of forming ozone by moistening the interior of a bell-glass receiver, or a large-mouthed bottle, with ether, and plunging into it a glass rod previously heated in the flame of a spirit lamp. On experimenting, some few weeks since, with ozone formed in this manner, I was surprised to find that, at the expiration of ten days, the bottle I had used, although open and freely exposed to the air, was still highly ozonized. I then ozonized a large glass vessel by the same process, and in the course of a few minutes thoroughly rubbed the interior with a towel, and found that, although the towel had become ozonized, the glass vessel still retained its power of liberating iodine from iodide of potassium, of decolorizing sulphate of indigo, of destroying sulphuretted hydrogen, &c. These properties were retained by the glass vessel and the towel for several days.

"Viewing ozone as oxygen in a dynamical condition, its increased activity giving it the power of rapidly converting the products of animal and vegetable decomposition into innocuous compounds, I began to test the power of this chemical ozone in a privy, the atmosphere of which was highly charged with sulphuretted hydrogen and probably other deleterious gases. Before commencing operations, I placed a vessel containing a weak solution of permanganate of potash on the seat, the lid being raised. In an hour the colour was perfectly destroyed. I then placed large glass jars, which had been ozonized by means of ether and a hot glass rod, in several parts of the privy; and by this, and other methods about to be described, I have kept the atmosphere so pure that a solution of permanganate of potash of the same strength as that first used will retain its colour for several days. On finding that cloths could be ozonized by merely rubbing them over an ozonized surface, I began to suspect that heat was not absolutely necessary, and on pouring a small quantity of ether into a wide-mouthed bottle, it immediately afforded ozonic reaction, which continued active for a considerable time. I have since found that sheets, blankets, beds, clothing, bandages. lint, carded cotton, paper, and many other materials may be ozonized by simply pouring a small quantity of *a certain kind of ether* over them. Unfortunately I am not able to describe what that particular kind of ether is, but believe it to be very old ether which has absorbed a good deal of oxygen, that process having been favoured by exposure to light. Out of upwards of thirty samples of ether which I have examined, I have only found one to answer the purpose thoroughly, and this I know was imported into the colony about eight years since. Of the other samples three or four answered tolerably well, and many gave no ozonic reaction at all.

"It is well known that oil of turpentine has the property of generating ozone. How it does so has not been satisfactorily explained. Some chemists consider that the oxygen of the atmosphere is converted into ozone by contact with the vapour of the turpentine; but this, like everything connected with ozone, seems to be veiled in mystery. I have found that many substances, particularly those which are known as disinfectants, will, under certain conditions, generate ozone. I have succeeded with the vapour of cajeput oil, carbolic acid, creasote, pyroligneous acid, kerosene, naphtha, coal-tar, and chloroform, the reaction from chloroform being very feeble.

"The question naturally occurs, Is it really ozone—active oxygen—that is generated by my simple process? I believe it for the following reasons: It rapidly destroys sulphuretted hydrogen; it converts sulphite of lead into sulphate; it liberates iodine from iodide of potassium; it possesses powerful bleaching properties, and quickly decolorizes a solution of sulphate of indigo; it oxidizes iron and silver when they are slightly moistened; it coagulates albumen and casein, altering their colour, and giving to them a greenish tinge; and it induces intense headache and sore-throat when it is breathed for any length of time.

"The normal amount of ozone in the atmosphere has not yet been determined. It must, however, be very small. It has been given, I think, by Dr. Bérigny, of Versailles, as one part in ten thousand. It is known to be more plentiful in the open country than within the confines of towns and villages, and it is also known to be almost entirely absent from inhabited houses.

"Now, it appears to me quite possible that the sanitary condition of hospitals, factories, schools, and indeed of all establishments in which the atmosphere is liable to become vitiated, may be greatly improved by the occasional presence of artificially generated ozone."

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42. *Deodorization and Disinfection.*—The Hastings Prize Essay for 1865, on this subject, by Dr. THOS. HERBERT BAKER, is published in the number of the *British Medical Journal* for January 6, 1866. The following is a summary of the author's conclusions:—

1. For the sick-room, free ventilation, when it can be secured together with an even temperature, is all that can be required.

2. For rapid deodorization and disinfection, chlorine is the most effective agent known.

3. For steady and continuous effect, ozone is the best agent known.

4. In the absence of ozone, iodine exposed, in the solid form, to the air is the best.

5. For the deodorization and disinfection of fluid and semi-fluid substances undergoing decomposition, iodine is best.

6. For the deodorization and disinfection of solid bodies that cannot be destroyed, a mixture of powdered chloride of zinc or powdered sulphate of zinc, with sawdust, is best. After this, a mixture of carbolic acid and sawdust ranks next in order; and, following on that, wood-ashes.

7. For the deodorization and disinfection of infected articles of clothing, etc., exposure to heat at 212° Fahr. is the only true method.

8. For the deodorization and disinfection of substances that may be destroyed, heat to destruction is the true method.

43. *Utilization of Fecal Matter.*—Dr. LECADRE, Vice-President of the Council of Public Hygiène and Salubrity of the Arrondissement of Havre, from a study of the different measures employed or proposed to utilize for agricultural purposes human excretions, arrives at the following conclusions:—

1. Rivers and canals existing in great cities ought not, under any circumstances, to serve as drains for sewage: they ought solely to be taken advantage of, in this respect, as affording facilities for transporting it to districts where it may be used for fertilizing purposes.

2. The state of the Thames, poisoned by the sewage of London, should not be forgotten. It is contrary to all the laws of public health to suffer a river or canal thus to become polluted, and to all the laws of good economy to lose thus gratuitously a product so rich and precious.

3. The tubular system of drainage, although it has been happily applied to several parts of England, has not yet been sufficiently studied; and it is so expensive that few cities in France could support the cost.

4. Hidden cesspools become sooner or later infected foci of putrid emanations; by the infiltration to which they give rise they may poison springs and wells; and they may even compromise the foundations of buildings.

5. It is necessary to return to the primitive system of movable receptacles, or tubs and fixed receptacles; and of the last named the receptacles above ground are better than those beneath the surface; but in all cases fixed receptacles ought to be walled, cemented, water-tight, and sufficiently ventilated.

6. Wherever canals and rivers exist, they ought to be used for the transport of barges, which would convey the contents of the cesspools to the river-side communes.

7. France, Belgium, England and Holland, are covered with railways, by means of which sewage might be conveyed by night, in closed movable reservoirs, to the adjacent lands.

8. It is desirable that there should be formed in each department, as in Lyons, a syndicate, to further economically, to the profit of health and agriculture, the dissemination of the town sewage in rural districts.

9. It is necessary to avoid great depôts of fecal matter, such as exist near Paris and Havre, and many other cities, and which exceed the actual needs of agriculture; and it may be hoped that, from the facility of transmission and greater perfection of subterranean conduits, the necessity for these depôts will cease.

10. Fecal matter loses much of its offensive character, whether in course of transport or at rest, if covered with dried, powdered earth, provided that this be argillaceous, or rather burnt according to the process of M. Salmon, or, still better, mingled with charcoal, as M. Maxime Paulet suggests. It may thus be disinfected on the instant.

11. Now that chemical studies lead to the discovery of new disinfectants, it is probable that, as in the case of sulphate of iron, already known for this property, other salts will be found still more effective for instantaneous disinfection, and which, like this preparation, will not prove injurious for agriculturists.—*Half-Yearly Abst. Med. Sciences*, July—Dec. 1865.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

44. *Death from Chloroform.*—Dr. J. D. GILLESPIE relates (*Edinburgh Med. Journ.*, January, 1866) the following interesting case of this. Last November he was sent for by a lady aged 17, to extract an upper molar tooth which was giving her great pain. He persuaded her to endure it some time longer. Some days subsequently he saw the patient again and found her in a great state of excitement. She begged for an anæsthetic before the tooth was drawn, and as Dr. G. had none with him some was sent for from the nearest druggist.

"Having ascertained," Dr. G. states, "that the patient's clothes were loosely fastened, and with another young lady and a servant in the room to give assistance if necessary, I placed her in a recumbent position on a sofa, sprinkled a small quantity of chloroform on a napkin, and commenced its administration. This I did by holding the napkin at a short distance from the face. She had not taken above a very few inhalations when she became violent, struggling, and screaming out very loudly, as if she felt the extraction of the tooth. Having got a very small further supply of chloroform on the napkin, I was proceeding to administer it, when I thought she was sufficiently unconscious, so put it aside, and, taking up the forceps, found further operations impeded by the jaws being firmly clenched. I managed, however, to force them open, applied the forceps, and extracted the tooth. I then rose from the side of the sofa, and went to the table, which was scarcely a yard distant, to get a tumbler of water to make her wash out her mouth, when I was startled by one or two long gasping respirations, the peculiar character of which I cannot explain, but which I have only heard when a patient was dying. Alarmed, I dashed some cold water over her face, which was deadly pale; examined the pupils, and found them greatly dilated; pulled out the tongue, which was not, however, retracted; felt for a pulse, but in vain, and then became convinced she was hopelessly dead.

"I commenced artificial respiration at once, and owing to the very elastic character of her chest, I felt that air freely entered under my manipulations; the hands were placed in hot water, and the feet and chest vigorously rubbed. Her brother was despatched to try and find additional medical assistance, and, in certainly less than five minutes, Dr. Graham Weir, who was in the immediate neighbourhood, entered the room. We continued our efforts for about half an hour, but to no purpose, the pupils still retaining their dilated state.

"The amount of chloroform altogether employed by me was 50 minims, and of this not more than a half, I should say, was actually made use of for the purpose of inhalation."

On *post-mortem* examination "nothing whatever abnormal was found, save that the left ventricle of the heart was very firmly and unusually contracted, and that it, as well as the left auricle, was perfectly empty. The right side of the heart was not gorged with blood, and there was no clot in any of the cavities. The lungs were quite natural in appearance, as also the brain, and all the other organs."

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45. *Respiration and Signs of Life in a Fœtus delivered at about Five Months' Gestation.*—Dr. J. D. MOORE relates (*Lancet*, Nov. 11, 1865) a case of this, which is of interest in a medico-legal point of view, with reference to succession or inheritance of property.

He was called to a woman who was flooding. "She had at that time a child ten months old, which was still suckling. The catamenia had appeared regularly since her last confinement, until last month, when they were absent. On examination, I found the membranes containing a fœtus protruding from the vulva. They burst almost immediately, and I removed the fœtus, and placed it, partially inclosed on the membranes, and with the placenta still attached, in a vessel of water which happened to be at hand, as the mother at that time required all my attention. In about twenty minutes I took it from the vessel, where it had been completely covered with fluid, in order to examine it, and while taking its measurement felt and saw distinctly pulsation both in the thorax and fontanelles, and, after watching it for a few seconds, saw it open its mouth and make inspiratory movements as if gasping for breath. The pulsation continued for some time, even after I had wrapped it in a napkin and carried it to my residence (about five minutes' walk), where it was also witnessed by several other medical men. The fœtus was from six and a half to seven inches in length, and probably of not more than five months' gestation."

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Case of Prolapsus Recti Successfully Treated. By JOHN PEACH, M. D., of Collington, Md.

In the spring of 1865, I was called to see a negro child about three years old, whose rectum had been prolapsing with each evacuation for more than a month, but at the time I saw the case had been permanently so for a week or ten days. The tumour was about the size of my fist, and tightly constricted by the sphincter. The whole surface was bloody and excoriated, with ulcerated patches in several places. It was with much difficulty reduced by cold applications and prolonged taxis.

The patient was put upon a semi-fluid diet; his bowels kept open, and astringent and anodyne injections thrown into rectum. On the next day I found the rectum again prolapsed, and returned it with even more difficulty than at first. This state of things was repeated for several days in spite of treatment and sparing and appropriate diet, the ulceration in the mean time extending, and sloughing being imminent, so tightly did the sphincter constrict it after protrusion.

I then devised the following mechanism to hold the rectum in place until the relaxed integuments could gain their accustomed tonicity, and at the same time to prevent any possible protrusion, the further occurrence of which would have undoubtedly hazarded the safety of the patient.

Not being near enough to an instrument maker to procure better materials, I took a piece of wire the size of a small bougie and about ten inches in length, bent a hook of two or three inches in length on one end, and fashioned it so as to fit the curve of the sacrum, the external portion fitting closely in the sulcus of the nates and reaching up to a level with the top of the sacrum. The end of the hook was covered with a pad about the size of the thumb and an inch in length. On the upper end of the wire was bent a smaller hook, through which bandages might be passed over the shoulders and around the abdomen to hold it in place.

The rectum was now returned, and the padded end of the hook, well smeared with an astringent ointment, was passed into the rectum, and the other end brought up between the nates and secured by bandages. The curve in the hook was such that the pad lying against the posterior wall of the rectum held it in its normal position against the curve of the sacrum. This contrivance was found not to interfere in the least with defecation or with the child's locomotion.

The previous treatment was kept up and the wire taken off and cleansed after each evacuation. It was worn in this manner for two weeks, then every other day for a week, and finally dropped altogether. There has been no recurrence of prolapsion up to the present time, and the child is now in good condition.

Case of Tapeworm probably contracted by Eating Beef or Veal. By J. H. BEECH, M. D., of Coldwater, Mich.

The following case has a tendency to support the opinion expressed by

Dr. Cobbold before the British Association "that tapeworm is often contracted from eating beef and veal."

A young man, aged 25, single, possessing more than ordinary intelligence, applied to me a few days since on account of indigestion, stating that he had, between 1860 and 1865, discharged several pieces of tapeworm, estimated to amount to full one hundred feet; that parts of it were in the hands of two different physicians, and that he had at home about 25 feet (and he believed the head) which was discharged after he had subsisted for several days principally upon pumpkin seeds, and then taken a large dose of turpentine.

In reference to the commonly received opinion that tapeworm was produced by eating measly pork, he stated that he had not been in the habit of eating much pork; had never eaten it raw except when well cured as bacon or salted for a long time; but that his occupation was formerly that of a butcher and salesman in a meat market, and that he was fond of and frequently ate raw beef and veal; also, that after he became certain that he was afflicted with tapeworm, he subsisted on very rare beef and Graham bread for a long time. More recently he had been boarding among comparative strangers, and had used more thoroughly cooked meat and a greater variety of food. He further stated that many of his former symptoms of the parasite were at present wanting, and it was my opinion that it was not now the cause of his complaint. He is plethoric at present, and fond of company, and doubtless abuses a stomach rendered more sensitive by what it has suffered.

Poisoning by Eating the Fruit of the Rhus Toxicodendron. By J. W. MOORMAN, of Hardinsburg, Ky.

The poisonous effects of the Rhus Toxicodendron are well known (see *Griffith's Medical Botany*, p. 184; *U. S. Dispensatory*, 12th ed., p. 836, &c.). Nevertheless but few cases we believe have been recorded of poisoning resulting from eating the fruit of the plant, and it therefore may be well to record two cases of this kind communicated to me by a professional friend.

The subjects of these cases were children, one six and the other eight years of age. The quantity eaten was nearly a pint. In a few hours the children became drowsy and stupid, and in a short time vomiting commenced, first of the partially digested fruit, afterwards of a thick, tenacious fluid of a wine color. Then convulsions of different parts of the body followed, accompanied by slight delirium. Respiration was hurried, pulse at first full and strong, but slow, afterwards small, frequent, and compressible; pupils dilated. Warm water was given to promote emesis and thus clear the stomach of the poisonous matter; afterwards large quantities of carbonate of soda in solution, under the belief that it was an antidote to the poison. Otherwise they were treated on general principles. Both cases recovered, though the youngest convalesced very slowly.

Spontaneous Umbilical Hemorrhage. By J. H. POOLEY, M. D., of Yonkers, N. Y.—

I WAS called, December 17, 1864, to see a girl, thirteen days old, who was bleeding from the navel. The funis had separated five days before in a perfectly natural way, and left an umbilicus quite healthy in appearance. The child, for several days after birth, was very much jaundiced, and its urine highly charged with bile elements; in every other respect it was quite healthy. The mother was attended in her confinement by a *wise-woman* of the neighbourhood, but I could not learn that any unusual circumstance had attended the birth.

The bleeding began the day before I saw the child, was very slight at first, had been gradually increasing, but, at the time of my first visit, it amounted to no more than a moderate and persistent oozing. I prescribed five drops of the muriated tincture of iron every two hours, and filled the umbilical depression with pulverized alum, applying over it a graduated compress and bandage. This failed, except for about an hour, to arrest the bleeding. In the evening, the hemorrhage increasing, with the concurrence and assistance of my friend, Dr. Upham, who had been called in consultation, I applied the ligature, *en masse*, by passing two stout steel pins at nearly right angles to each other through the integument and under the navel, and twisting a wax-end silk thread tightly over them in a figure of 8. This appeared to check the bleeding for a couple of hours, but it again recurred and continued through the night.

The next day, the 18th, Dr. Upham saw the child and applied the perchloride of iron without any good effect. I saw my little patient about twelve o'clock; it was then very pale and languid, evidently failing. Saw it again at 5 P. M.; bleeding continued; child sinking rapidly; applied pulverized matico. Died at midnight. No post-mortem was allowed. The mother of this child had given birth to five others, all of whom had died in early infancy, and most of them, it was said, from some form of marasmus; they were all deeply jaundiced soon after birth.

DOMESTIC SUMMARY.

Aphasia.—The attention of clinical observers, Prof. Austin Flint observes (*Medical Record*, March 1, 1866). has recently been directed to a loss of power of speech occurring without inability to perform the movements involved in the utterance of language, and without any lesions of the organs of phonation, for which affection M. Trousseau has proposed the name *aphasia*. "All observers," the Professor remarks, "agree that the affection, in the great majority of cases, is associated with hemiplegic paralysis, and that the paralysis, as a rule, is on the right side of the body; hence, it has been inferred that the faculty of speech is seated in the left hemisphere of the brain. A French observer, Dr. Dax, appears to have collected the largest number of cases, viz., 140, in which the paralysis was on the right side.[1] It is intimated, however, that some of these cases were not cases of veritable aphasia. Dr. J. Hughlings Jackson, of London, has reported 34 cases, of which in all but three the right side was paralyzed.[2] In a large proportion of these cases cardiac murmur coexisted, a fact which the reporter considers as tending to show the probable production of the paralysis by embolism. According to Trousseau, in the immense majority of cases there exists softening of the brain. The affection, however, is not invariably associated with hemiplegia—that is, it may be independent of paralysis; and that it may exist without softening or other structural lesions is rendered probable, not only by the fact just stated, but by the complete recovery from the paralysis in some of the cases in which the latter coexists."

Prof. Flint gives an account of six cases of this affection which have fallen under his observation at Bellevue Hospital. In four of these cases the hemiplegia affected the right side; in the remaining two he is unable to say which side was hemiplegic. He does not believe. however, that the mental faculty of speech is *localized* in the left hemisphere of the brain. "Irrespective," he says, "of the improbability of the faculty being seated in either hemisphere to the exclusion of the other, this question is to be answered negatively in view of the fact that aphasia does occur in cases of hemiplegia affecting the left side, although the number of such cases is comparatively few. Were the faculty of speech seated exclusively in the left hemisphere, there should be no exceptions to the rule of the hemiplegia being on the right side. The situation of the hemiplegia on the right side, in the great majority of the cases of aphasia, is, however, a striking fact, which, of course, has an adequate explanation. Autopsical researches may show that the loss of speech depends on a particular situation, in either hemisphere, of the morbid conditions giving rise to the paralysis; and that, for reasons at present unknown, this situation is more likely to be involved when the conditions are seated in the left than in the right hemisphere. In the only one of the six cases in which an autopsy was made, there was circumscribed softening of the anterior lobe of the left hemisphere, the softening extending to the superficies. So far as this case goes, it sustains the statement of Trousseau, that in aphasia there generally exists softening.

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[1] Archives de Médecine, Jan. 1865, and London Lancet, Aug. 1865.

[2] Clinical Lectures and Reports, London, 1861; and Archives de Médecine, March and April, 1865.

"In all these cases the aphasia persisted without any improvement. So far as these cases go, they do not afford encouragement to expect the return of the power of speech, even when recovery from the hemiplegia is nearly complete. Recovery from aphasia does, however, sometimes take place. I have met with an instance of incomplete aphasia, in private practice, associated with transient hemiplegia, in which, after a few days, the memory of words returned. A case of recovery from complete aphasia, with hemiplegia, is reported in the *Buffalo Medical and Surgical Journal* for November, 1865, by Dr. Conger. Trousseau and others have reported cases of recovery.[1]

"In cases of persistent aphasia it is not easy to determine to what extent the mental faculties are preserved, aside from the memory of words. The ability to comprehend freely what is said, and sufficient intelligence to perform routine duties, are certainly not incompatible with the loss of speech; but it is extremely difficult to ascertain the mental condition as regards the reasoning powers, judgment, and sentiments. Trousseau is of opinion that the intelligence is always impaired to a greater or less extent. With reference to this point of inquiry, further study of the affection is desirable. The affection, in this aspect, has an obvious and important medico-legal bearing."

Gutta-Percha Shoe in the Treatment of Talipes.—Dr. **ALFRED C. POST** extols (*Medical Record*, March 1, 1866) the gutta-percha shoe in the treatment of talipes as preferable to the spring ordinarily employed. The material which he ordinarily uses in the construction of these shoes, he says, "is a gutta-percha sheet from a sixteenth to an eighth of an inch in thickness. It is cut of such a shape as to adapt itself to the sole and sides of the foot, leaving a space uncovered on the dorsum of the foot equal to about one-third of the breadth of the foot; it is also adapted to the sides of the leg, extending up two-thirds of the distance to the knee, and leaving a narrow space uncovered before and behind, each space so uncovered being about one-sixth of the circumference of the leg. The material is readily moulded to the shape of the limb by immersing it for a few seconds in water at a temperature of 100° Fahrenheit. I am in the habit of moulding the shoes, thus heated, over a wooden last made for the purpose. The last is not made after the fashion of a bootmaker's last, but it is shaped like the natural leg and foot, except that the outer side of the foot is made to correspond with the inner, thus obviating the necessity of having separate lasts for the right and left foot."

He generally commences the treatment of infantile club-foot "by the subcutaneous division of the tendo-Achillis, after which I apply a strip of isinglass plaster over the small wound of the skin. I then have the foot held by an assistant as nearly as possible in its normal position, and while it is so held I carefully apply a roller bandage so as to cover the foot and leg, beginning the application on the outer side of the ankle. I then apply the gutta-percha shoe, an assistant grasping the leg with one hand, pressing the upper part of the shoe against the sides of the limb, and with the other hand pressing the sole of the shoe against the sole of the foot. While the shoe is thus firmly pressed against the leg and foot, I apply a roller bandage firmly, so as to secure it in its place. After the lapse of twenty-four to forty-eight hours, I take off the bandages and shoe, wash the foot, wipe it dry, use passive motion freely in different directions, and then reapply the apparatus as before. The application is repeated at intervals of two or three days until the foot is brought to its proper shape, when it is put up in a laced boot, lacing to the toes, and having a firm sole and stiff sides, provided with iron braces which extend nearly as high as the knee, and secured by a strap and buckle around the upper part of the leg.

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[1] [An extremely interesting and instructive case of aphasia, in which recovery took place, is recorded by Professor S. Jackson in the No. of this Journal for Feb. 1829, p. 272.—ED. AM. JOUR.]

"The following are, in my estimation, the advantages of the gutta-percha shoe over Scarpa's shoe and its various modifications:—

"1. Its greater simplicity, and the ease with which it is made. When the material is at hand, the shoe can readily be made in fifteen minutes.

"2. It is much cheaper than the spring shoe.

"3. It is more comfortable to the patient, being lighter, exerting a less injurious pressure, and being less likely to be kicked off by a restless child.

"4. It is much less likely to occasion excoriation or ulceration of the integuments.

"5. It expedites the cure, giving a better support to the foot, and bringing it more readily into its normal position."

Amputation at the Hip-Joint.—Dr. A. M. Fauntleroy, of Staunton, Va., reports (*Richmond Medical Journal*, Jan. 1866) a case in which he performed this operation with success. The subject of it was a soldier, 37 years of age, of previous good health, admitted into the General Hospital at Staunton, Va., 19 December, 1864, who had had his right thigh amputated at the lower third October 17th, 1864, for a gunshot wound of the knee-joint. By the 1st January, 1865, the stump had almost cicatrized, except two small apertures from which there was a discharge, during the 24 hours, of four or five ounces of fetid pus.

This discharge subsequently increased in quantity, and an exploration with a probe revealed the bone to be denuded of periosteum and much roughened. Dr. F. therefore decided to open the face of the stump, and remove the diseased bone, which he proceeded to do March 11th, 1865. The patient having been given some whiskey, and then chloroform by inhalation, the face of the stump was opened and the bone found so much diseased that "it was determined to proceed with the exploration, until sound bone was reached. With this view, an incision was made on the outer aspect of the thigh, between the vastus externus muscle and the biceps femoris; this incision was ultimately extended over the trochanter major, on a line with the superior spinous process of the ilium—the disease extended to the head of the bone, requiring its entire removal.

"The glenoid cavity was found healthy. In the operation, digital compression was made, over the pubic bone, upon the femoral vessel; the arteries were tied, as they were cut; the superficial and deep femoral vessels were secured by ligation; the flaps were then made, leaving them somewhat longer than is usual in hip-joint amputations. The patient's loss in arterial blood was trifling in amount; the flaps were secured by silver wire sutures, and the stump was dry-dressed.

"As soon as the patient was restored to consciousness, half an ounce of whiskey was administered every fifteen minutes until reaction became manifest, and warm bricks were applied to the body and extremity. The patient rallied completely in a few hours, and drank during the day nearly a pint of cream, and ate two soft-boiled eggs. The whiskey was exhibited every half hour during the evening, and every hour during the night. At bedtime his pulse numbered a hundred and twenty beats. (He stated that normally his pulse is very frequent and quick.)"

Under judicious treatment, consisting mainly of nourishment, stimulants, tonics, and sedatives, the patient gradually recovered, and on the 18th July was discharged in excellent health, and walking upon crutches.

Colotomy for Relief of Cancer of the Rectum.—Prof. GEO. C. BLACKMAN relates (*Cincinnati Journal of Medicine*, Jan. 1866) an interesting case of cancer of the rectum in a coloured man aged 35, in which he performed Amussat's operation. The patient had not had an evacuation from his bowels for ten days, was unwilling to eat, and was rapidly becoming emaciated, when on the 15th of Oct. Prof. B. "exposed, according to the usual method, the left descending colon in the lumbar region, and, having secured it by means of a ligature, I made an incision into the bowel of about one and a half inches. The intestine was then fastened to the lips of the wound by several interrupted sutures. On incising the colon, neither feces nor flatus escaped, but, with the point of my finger, I could easily reach the solid contents of the bowel. I made no attempt to bring on a discharge, but removed him to his bed, and directed him to keep quiet. The stitches were not removed until the ninth or tenth day. About this period a dose of castor oil was administered, and fecal matter passed freely both by the artificial anus and the rectum. From that until the present time—December 26—the fecal matter has passed altogether through the artificial opening. The patient has indulged freely in the use of solid food, and has gained rapidly in flesh and strength. During the past ten weeks he has had two attacks of hemorrhage from the fungous mass within the rectum. One of these was severe, and required injections of persulphate of iron to arrest it. With the exception of these temporary drawbacks, his improvement has been most gratifying, not only to himself, but to all who have witnessed the progress of the case. Since the operation he has occasionally, from imprudence in eating, been troubled, for a day or two, with diarrhœa and incontinence; but, as a general rule, the artificial anus has given him no trouble on this account. He states that, when his bowels are in a natural condition, fecal matter passes readily; then, as in a healthy condition of the rectum and anus, the opening seems to close. There is at the present time a plug of mucous membrane, which gently protrudes, and which probably aids, to a certain extent, in the retention of the feces. The patient suffers no more from the excruciating tortures which rendered him, before the operation, so miserable, and which threatened soon to terminate his existence, and has no hesitation in declaring that, even if his life should not be prolonged another day, he has been amply repaid for submitting to the operation. He has taken one grain of opium every night since the operation, and is now taking of the bromide of iron three grains three times in the day, with occasional injections of the persulphas ferri to the diseased rectum. By these means we hope to hold in check the progress of the cancer.

Gunshot Wound of the Brain; the Ball traversing both Hemispheres; Death from Scarlatina six months afterwards.—Dr. JOHN HUTCHINSON presented to the Medical Society of County of Kings an interesting case of this.

The subject of it was a girl seven years old injured by a *buck-shot penetrating the cranial cavity.* The child *walked* to the office and back home. A *probe passed* into the track of the ball *four inches. No brain symptoms appeared* except slight vomiting, which lasted but two or three days. *Entire recovery* took place, the child going to school and playing as other children. Subsequent death six months afterwards from another cause and a post-mortem examination revealing that there had *been no disease of the brain;* that the *ball* had *traversed* the posterior lobes of both hemispheres of the cerebrum, and rebounding had lodged in the brain substance, where it had remained with impunity, causing no inconvenience, and had become almost "a forgotten thing."—*Buffalo Med. and Surg. Journ.*, Jan. 1866.

Dislocation of the Patella on its Axis.—Dr. Hamilton, in his excellent work on fractures and dislocations, states that not more than fifteen examples have been recorded of this accident. A very interesting one was detailed in the number of this journal for April, 1843, by Dr. Gazzam, of Pittsburg; and another occurred in the practice of our friend the late Dr. Jno. Watson, of New York (*New York Journ. of Med.*, Oct. 1839).

The following recent case was reported to the Buffalo Medical Association by Dr. Rochester (*Buffalo Med. and Surg. Journ.*, Dec. 1865): "On the evening of 28th August, a large and growing lad, of sixteen years, fell, striking his knee on the curbstone. On seeing him, a few minutes after the accident, the right patella was found completely dislocated outward, and *turned upon its edge*, standing at right angles with its normal position. The knee was slightly swollen, and very tender and painful to the touch. Chloroform was given to complete anæsthesia, and two or three unavailing efforts were made to replace the bone, the limb being fully extended, and the foot elevated. Dr. Gay, who was also present, then, by a different procedure, at once reduced the dislocation: he flexed the leg upon the thigh, and the thigh upon the body, and then extended, and at the same time rotated the limb, pressing, meantime, firmly upon the patella, which immediately slipped into its place, while the limb was passing from flexion to extension."

Dislocation of the Thigh upon the Dorsum Ilii.—Dr. A. M. Fauntleroy records ("*Confederate States Journal*") an interesting case of this reduced by manipulation twenty-five days after the accident. The subject of it was a soldier, 25 years of age, admitted into the hospital at Staunton October 12, 1864. While riding on an ordnance wagon September 22, it had been upset, and the patient was thrown upon his face, a portion of the ammunition falling on his hip and thigh.

On examination there was observed "loss of rotundity of left buttock; left femur was slightly flexed, and rotated with adduction; the knee resting upon the patella of the right thigh and the ball of the big toe upon the dorsum of right foot. Great pain was experienced upon an attempt to extend the thigh, and considerable manual traction made without chloroform failed to dislodge the head of the bone from its abnormal position. Manipulation was decided upon, and, with the aid of chloroform, was successfully employed. The patient was placed upon the table, upon his right side, the leg of the injured side being flexed upon the thigh, and the latter flexed strongly upon the body, with slight abduction. The adhesions which the head of the bone had contracted were broken up at the first attempt, and the bone assumed a new position in the great ischiatic notch, somewhat sustaining the views of Boyer, that this latter dislocation is always consecutive in occurrence.

"The head of the bone was felt in its new position, shortening slightly lessened, and foot not quite so much inverted. A second essay was made, the manipulation differing from that used in the first instance by the traction made upon the femur at the moment of its flexion upon the body, and its abduction, by which means the head of the bone was lifted over the edge of the acetabulum, and returned into the cotyloid cavity without snap, and the limb was extended and found to be normal in position and length.

"He was retained in bed for a few days, and ordered to apply liniment. ammoniæ over the gluteii muscles. The soldier was furloughed on the 27th of October for thirty days, still complaining of considerable soreness of the hip."

Constituents of Veratrum Viride.—Mr. Charles Bullock (*Amer. Journ. Pharm.*, March, 1866) publishes some interesting investigations made by him relative to the alkaloids in the veratrum viride. The following is a summary of his conclusions:—

1. That veratrum viride contains two alkaloids, one soluble in ether and the other insoluble in that menstruum. Neither of these principles answers in its chemical reactions to veratria.

2. That the resinous matter which precipitates when the concentrated tincture of the root is poured into acidulated water carries down with it a notable portion of the alkaloid insoluble in ether.

3. That the alkaloid insoluble in ether, when administered in small doses, has a

very perceptible sedative effect on the circulation without producing any other disturbance.

4. That the pure resin produces sedative effects nearly or quite equal to those obtained from the alkaloid.

The late Professor Chandler R. Gilman.—At a meeting of the Trustees of the College of Physicians and Surgeons, of the city of New York, held on the 10th inst., the death of Chandler R. Gilman, M. D., Professor of Obstetrics and the Diseases of Women and Children, having been announced, it was

Resolved, That the Trustees of this College have heard with deep regret of the decease of one of the most eminent of its Professors.

Resolved, That during the long period during which the late Dr. Gilman has taught in this College, the talent, earnestness, and zeal with which he has devoted himself to the instruction of its pupils has always secured him their entire respect and admiration, and the uniform, urbane, and considerate manner of his association with his class has equally entitled him to their affection and good-will.

Resolved, That these resolutions be published in the daily papers, and a copy transmitted to the family of the deceased.

EDWARD DELAFIELD, M. D., *President.*

GURDON BUCK, M. D., *Registrar.*

At a meeting of the President and Faculty of the College of Physicians and Surgeons, held October 16, 1865, the following preamble and resolutions were unanimously adopted:—

Whereas, It has pleased Almighty God to remove from this world our friend and colleague Professor Chandler R. Gilman, while humbly bowing to this dispensation of an all-wise Providence, we, who have shared his toils and witnessed his devotion to the exalted duties of a self-sacrificing profession, may be permitted to give some public expression to the feelings that so sad an event cannot fail to excite; therefore,

Resolved, That in the death of Dr. Gilman this institution has lost an able, successful, and distinguished teacher; its officers an intimate, tried, and endeared personal friend; the medical profession a wise and trusted counsellor; and the community a learned and deservedly eminent physician, a profound thinker, and a great and good man.

Resolved, That while, from the chair which for twenty-five years he has adorned, he has eloquently taught the true principles of medical science, and has distinguished himself as a leader in scientific progress, he has no less, in blameless life, honourable character, genial sympathies, reverence for truth, respect for the rights of others, in his graceful literary attainments, in his faithfulness and zeal in all professional duties, and in his jealous watchfulness over professional purity and honour, left an example worthy the imitation of the thousands who have listened to his teachings, and cherish his principles.

Resolved, That to his bereaved family we tender our heartfelt sympathy, invoking for them Heaven's choicest consolations, and assuring them that we shall ever cherish in our hearts pleasant memories of his life and labours.

J. C. DALTON, M. D.,
Secretary of the Faculty.

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JEFFERSON MEDICAL COLLEGE.

SUMMER COURSE OF LECTURES.

The Summer Course of Lectures in this College will begin on Monday, April 2d, 1866, and continue, with a recess in July and August, until the 6th of October.

The Clinical department of the Course will be Illustrated at the College, the Wills Hospital, and the Philadelphia Hospital, by the members of the Association during their terms of service at these Institutions.

The Courses will be of an entirely practical character, embracing important specialties in Medicine and Surgery, with extensive Clinical Illustrations.

The Lectureships are constituted as follows:—

Clinical Surgery	Profs.	Gross & Pancoast.
" Obstetrics	"	Wallace.
Pathology	"	Dickson.
Hygiene and Meteorology	"	Rand.
Materia Medica and Therapeutics	"	Biddle.
Clinical Medicine	Dr.	DaCosta.
Visceral and Surgical Anatomy	"	W. H. Pancoast.
Operative and Minor Surgery	"	S. W. Gross.
Physiology	"	J. Aitken Meigs.
Ophthalmic Surgery	"	R. J. Levis
Venereal Diseases	"	F. F. Maury.

Fee for the full course $35 for non-matriculates.

For further information apply at the College, or 1005 Walnut Street.

Philadelphia, March 1, 1866. F. F. MAURY, *Secretary of Assoc.*

HARVARD UNIVERSITY.

SUMMER SESSION OF THE MEDICAL DEPARTMENT.

The Annual Course of Summer Instruction in the Medical Department of Harvard University will commence at the Massachusetts Medical College, in North Grove Street, Boston, on Monday, March 12, 1866, and continue till November.

Clinical, Medical and Surgical Instruction will be given at the Mass. General Hospital, adjoining the College, at the City Hospital, and at the Boston Dispensary.

Recitations from approved text-books will be held daily during the session at the College, upon all branches necessary to a medical education. Occasional lectures are also given, and demonstrations, illustrated by the Museums of the College.

During the Summer Session, instruction is given by lectures at Cambridge, on Botany, by Prof. Gray; on Comparative Anatomy, by Prof. Wyman; on Zoology, by Prof. Agassiz; on Acoustics and Optics, by Prof. Lovering. To these lectures, students of the Summer Session will be admitted without extra charge.

Fees for the Summer Term (which must be paid in advance), $100, without extra charge for Matriculation, Hospital, Library or Dissections; for six months, $100; for three months, $50.

D. Humphreys Storer, M. D.,	Professor of Obstetrics and Medical Jurisprudence.
John B. S. Jackson, M. D.,	Professor of Morbid Anatomy.
Henry I. Bowditch, M. D.,	Professor of Clinical Medicine.
Calvin Ellis, M. D.,	Adjunct Professor of Clinical Medicine.
Oliver W. Holmes, M. D.,	Professor of Anatomy and Physiology.
George C. Shattuck, M. D.,	Hersey Professor of the Theory and Practice of Physic.
C. E. Buckingham, M. D.,	Adjunct Professor of the Theory and Practice of Physic.
Henry J. Bigelow, M. D.,	Professor of Surgery and Clinical Surgery.
John Bacon, M. D.,	Professor of Chemistry.
Edward H. Clarke, M. D.,	Professor of Materia Medica.

David W. Cheever, M. D., Demonstrator.
J. E. Tyler, M. D., Assistant in Theory and Practice.
Samuel L. Abbot, M. D., Assistant in Clinical Medicine.
Fitch E. Oliver, M. D., Assistant in Materia Medica.
Francis Minot, M. D., Assistant in Theory and Practice.
Richard M. Hodges, M. D., Assistant in Surgery.
Horatio R. Storer, M. D., Assistant in Obstetrics.
J. Nelson Borland, M. D., Assistant in Clinical Medicine.
James C. White, M. D., Assistant in Chemistry.

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No. 2 Staniford Street, Boston.

Circulars can be obtained gratis, upon application to David Clapp & Son, Medical and Surgical Journal Office, over 334 Washington Street, Boston. Jan. 1st, 1866.

[Jan. and April.]

UNIVERSITY OF MARYLAND.

The Fifty-Ninth Session of the School of Medicine, in the University of Maryland, will commence on Monday, the 15th of October, 1866, and will end on the 1st of March, 1867.

FACULTY OF PHYSIC.

Nathan R. Smith, M. D., Professor of Surgery.
Wm. E. A. Aikin, M. D., LL.D., Professor of Chemistry and Pharmacy.
G. W. Miltenberger, M. D., Professor of Obstetrics and the Diseases of Women and Children.
Richard McSherry, M. D., Professor of Institutes and Practice of Medicine, and of Hygiene.
Christopher Johnston, M. D., Professor of Anatomy and Physiology.
Samuel C. Chew, M. D., Professor of Materia Medica and Therapeutics.
F. Donaldson, M. D., Professor of Physiology and General Pathology.
James H. Butler, M. D., Demonstrator of Anatomy.

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The Baltimore Infirmary is a large hospital attached to the College. The Infirmary is an admirable school for clinical instruction, which is open every day throughout the year to the students, where they may witness surgical operations, observe practice, and attend clinical lectures by the various professors at all seasons, without any additional charge. There is always a staff of graduates resident in the Infirmary, besides a limited number of students who are admitted as Clinical Assistants.

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Circulars containing fuller information may be obtained by application to any member of the Faculty.

GEORGE W. MILTENBERGER, M. D., *Dean.*

Baltimore, March, 1866.

BERKSHIRE MEDICAL COLLEGE.

The Forty-Fourth Annual Course of Lectures in this Institution will commence on Thursday, June 14th, 1866, and continue eighteen weeks.

FACULTY.

H. H. Childs, M. D., President.
Wm. Warren Greene, M. D., Dean.
Henry H. Childs, M. D., Emeritus Professor of the Theory and Practice of Medicine.
Corydon L. Ford, A. M., M. D., Professor of Anatomy and Physiology.
Wm. Warren Greene, M. D., Professor of Principles and Practice of Surgery and Clinical Surgery.
Alonzo B. Palmer, A. M., M. D., Professor of Pathology and Practice of Medicine.
Wm. C. Richards, A. M., M. D., Professor of Chemistry and Natural History.
Horatio R. Storer, A. M., M. D., Professor of Obstetrics and Diseases of Women.
A. B. Palmer, A. M., M. D., Acting Professor of Materia Medica and Therapeutics.
Horatio R. Storer, A. M., M. D., Acting Professor of Medical Jurisprudence.

Frank K. Paddock, M. D., Demonstrator of Anatomy and Prosector of Surgery.

By the recent action of the officers of the College, two weeks have been added to the Course, making it now eighteen weeks in length; and it will hereafter commence on the Thursday nearest the middle of June, instead of the first Thursday in August, as heretofore; thus giving time for a *full* Summer Course without interfering with the Winter or Spring terms of other schools.

It is intended that the course of instruction in each department shall be *eminently* thorough.

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WM. WARREN GREENE, M. D., *Dean.*

Pittsfield, Mass., February 17, 1866.

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EDWARD A. SMITH, M. D., D. MURRAY CHESTON, M. D., HORACE WILLIAMS, M. D.

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It may be added that no pains or expense have been spared to render the mechanical execution of the volume worthy in every respect of the character and value of the teachings it contains.

Dr. Hodge having been engaged for thirty-one years in the teaching of Obstetrics, has very justly thought that the results of his large experience and reflections might be of advantage to the profession. These he has therefore communicated in a handsome, well illustrated volume. An excellent text-book; while he shows that in the management of parturient women he has been guided quite as much by his personal experience as by the teachings of other men. A valuable contribution to medical literature. It gives evidence of very hard work, and it shows that Dr. Hodge may say, in the words of Baudelocque, "Though the reading of authors has been of great use to me, it will be found that the study of nature has been of much more."—*London Lancet*, Aug. 20, 1864.

Works on Cutaneous Diseases.

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